

Journal

OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION

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Correspondence

December 11, 1958

Dear Dr. Aitken:

The abstract, "Shackling as a Factor in Ham Hip-Joint Hemorrhage" by Kitchell, *et al.* (JOURNAL, Dec. 1, 1957, p. 500), raises an interesting question. It states: "Two lines of evidence indicate that the gambreling procedure, whereby the carcass is suspended by a gambrel inserted in the hindlegs, is largely responsible for producing the internal hemarthrosis." Since gambreling occurs after exsanguination and death, could this cause a hemorrhage in body tissues or joint capsules?

Sincerely yours,
s/J. L. KOLODNER, V.M.D.
Philadelphia, Pa.

February 7, 1958

Dear Dr. Aitken:

Thank you for referring Dr. Kolodner's letter to me for reply. His question is a natural one and has previously been asked by members of the meat-packing industry, some of whom couldn't conceive of a "bruise" developing unless the injury occurred more than 24 hours antemortem. The installation of CO₂-immobilization units and sticking and bleeding conveyors in a number of packing plants last year attests to their acceptance of our findings.

For greater detail concerning the evidence supporting the conclusions stated in our abstract, reference should be made to the original article (*Am. J. Vet. Res.*, July, 1957, pp. 491-501). There we have cited two lines of evidence which indicate that the gambreling procedure is responsible for producing the internal hemarthrosis. Both are based on the relative incidence of blood in the joint cavity under differing experimental procedures.

In hogs routinely processed, where shackling of one hindleg and gambreling of both hindlegs was used, approximately 85 per cent of all the coxofem-

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oral joints contained blood, synovial fluid. When hogs were exsanguinated without shackling, then gambreled, the incidence was also approximately 85 per cent, whereas when hogs were exsanguinated and gambreled by the *front* legs the incidence was zero; evidence indicates that the condition develops after exsanguination and death.

Considerable blood remains in the vascular system of an animal after exsanguination and in the gambreling procedure, pressure is exerted on the pelvic limbs and viscera so, if the vascular system is torn, some of the blood could be extruded out of the broken vessels into the joint cavity. If the joint capsule is also torn, this bloody synovial fluid could be forced out into the intermuscular septums by the swinging of the carcass on the gambrels.

On the basis of the evidence, most of the internal hemarthroses could occur after the hog has been exsanguinated.

Sincerely yours,
s/RALPH L. KITCHELL, D.V.M., Ph.D.
Stockholm, Sweden.

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(Continued from page 38)

person's knowledge is a kind of "black edge" of a world to understand the real world. For a few minutes, you can see that world like a child's dream, as if it were really in a way.

A few days past and he knows what's going on and he'll come to be someone. When he does, you'll know he's not, because he can see the real world, and the world is not a child's dream.

There are two kinds of dogs that have been with dogs since the first day. All, and those that have been with dogs and the world of living in a way.

The dogs are the real dogs, all of them. Some will know all right in the world, but they will know the dog's world, and the dog's world is not a child's dream.

When the dog's world is not a child's dream, he will know the dog's world, and the dog's world is not a child's dream. He will know the dog's world, and the dog's world is not a child's dream.

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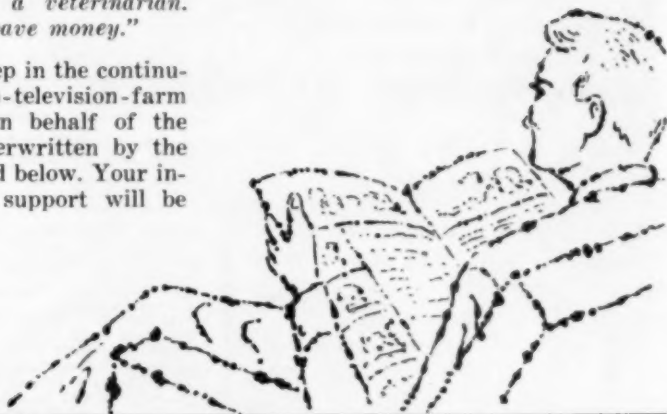
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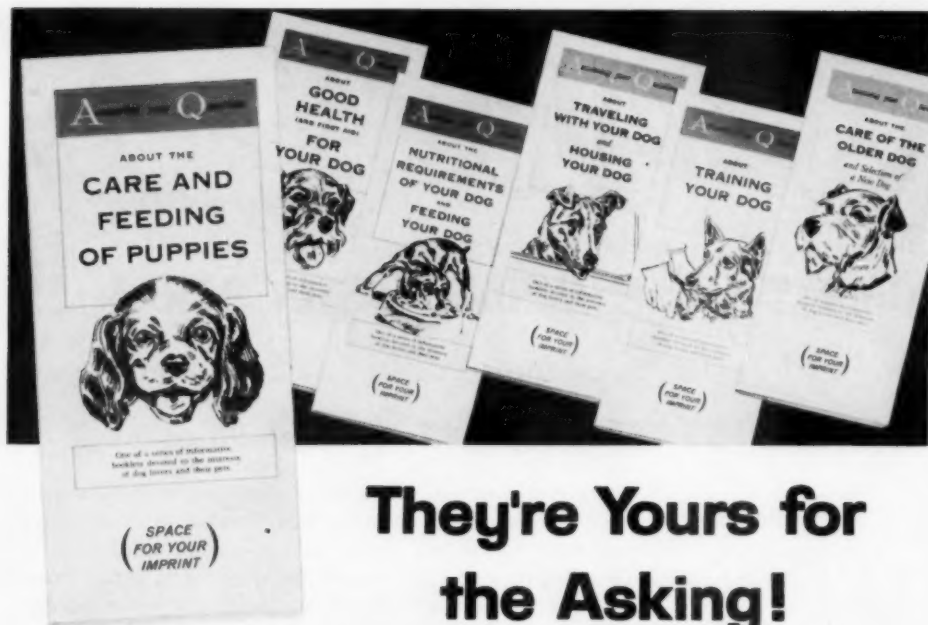
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Legislative.—Senate Committee on Agriculture reported favorably on bill to extend the **accelerated brucellosis control program for two years**, until June 30, 1960. This program authorizes the transfer of \$20 million annually of Commodity Credit Corporation funds. The Committee in its report stated that the accelerated program has resulted in great improvement in the brucellosis situation.

The House Agricultural Committee held hearings Feb. 26 and 27, 1958, on a number of bills to extend the brucellosis program. The AVMA, in its statement to the Committee, urged the program be continued with \$20 million available annually until 1960.

★ ★ ★ ★

The House, on February 4, following lengthy debate, **passed H.R. 8308, the humane slaughter bill** (see JOURNAL, Aug. 15, 1957, adv. p. 6). The purpose of the bill is to establish a national policy in the slaughtering of livestock and poultry. Senator Humphrey has prepared an amendment, S-1497, which would amend his original bill to make it identical with H.R. 8308. If the bill passes the Senate, the federal government, after Dec. 31, 1959, would be restricted to purchasing meat products from packers in compliance with slaughtering methods prescribed by the Secretary of Agriculture.

★ ★ ★ ★

Subcommittee No. 2, Representative Kilday, chairman, of the House Armed Services Committee, has been holding hearings on H.R. 9979, a bill to change the method of computing military pay. The purpose of the proposed legislation, as stated by the Department of Defense, is to effect a fundamental modernization and improvement in the present system of compensation, and provide additional incentive to attract and retain quality personnel. Since numerous questions were raised during the hearings to certain features of the bill, it is expected the committee, following study of all testimony, will report out a new bill.

★ ★ ★ ★

Miscellaneous.—Gordon Gray, director, Office Defense Mobilization, has issued an order spelling out the functions and responsibilities of his Health Resources Advisory Committee (see JOURNAL, Feb. 15, 1958, adv. p. 10). This group shall: (1) advise the director on mobilization of health resources; (2) make recommendations on questions of policy relating to allocation, utilization, and administration of such resources in any emergency; (3) interpret views of "health community of the country" on matters pertaining to mobilization of health manpower, facilities, and supplies.



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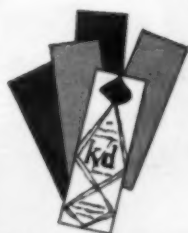
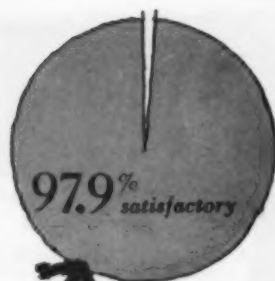


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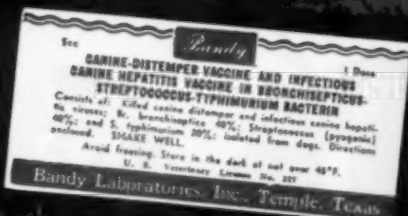
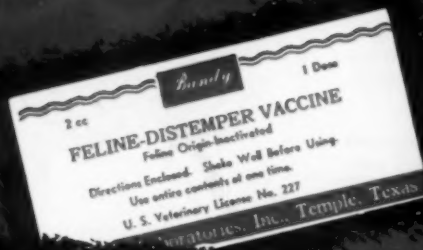


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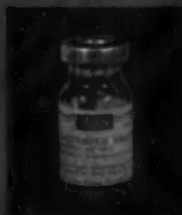


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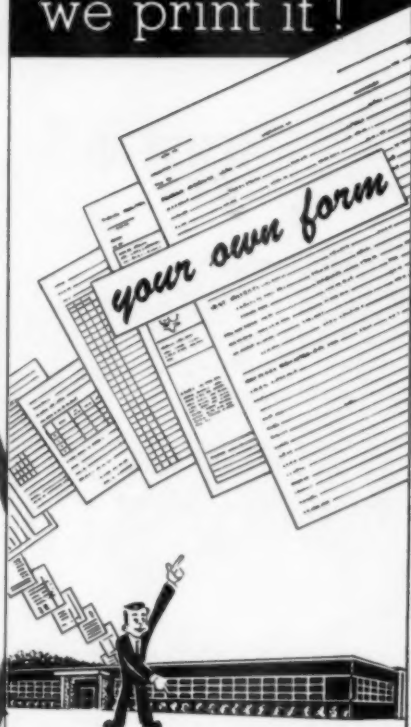
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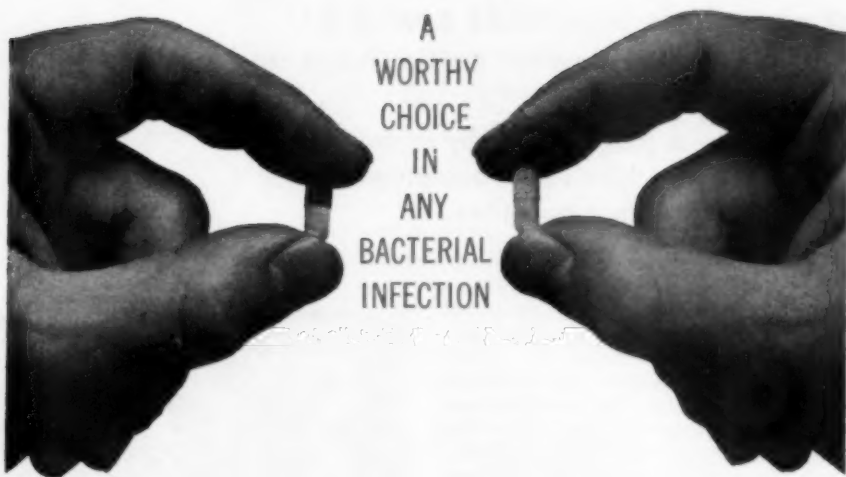
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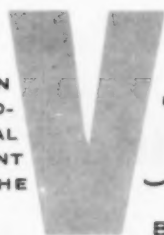
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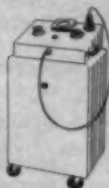
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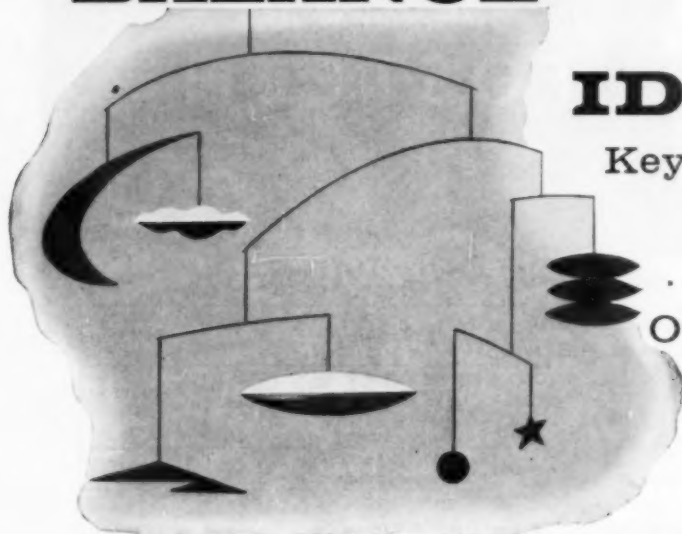
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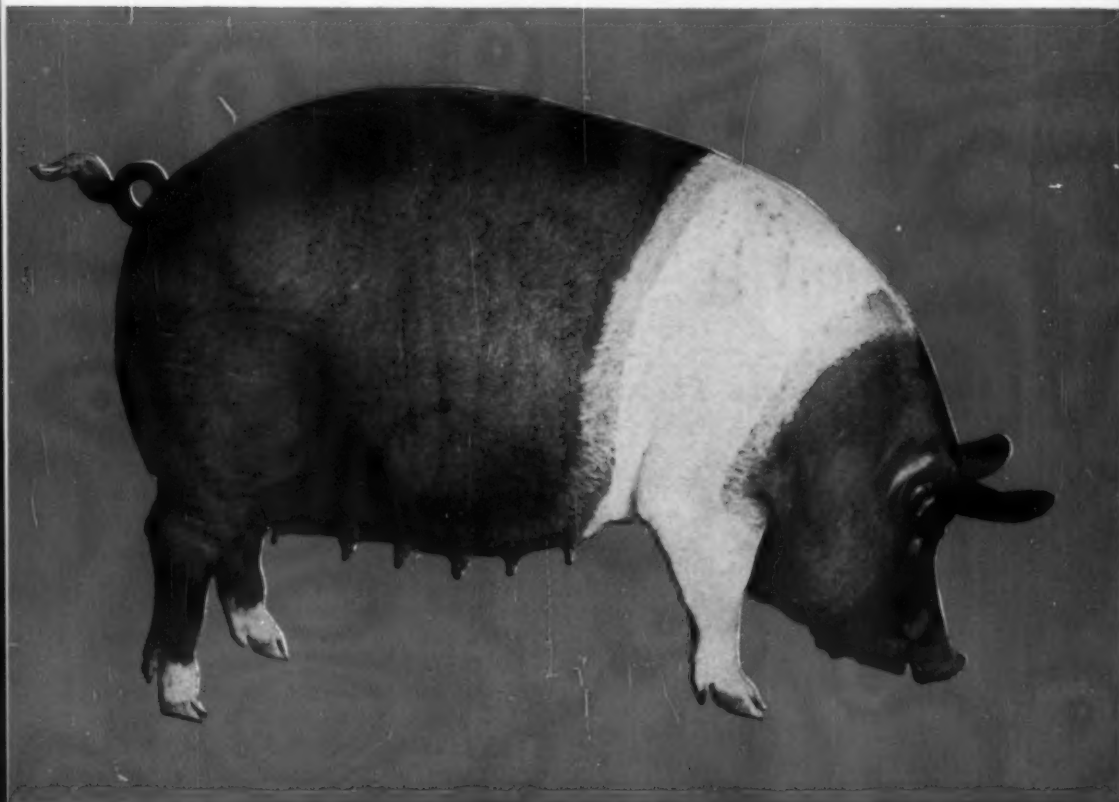
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Hypertrophic Osteoarthropathy in a Dog with Pulmonary Metastases Arising from a Renal Adenocarcinoma

ROBERT S. BRODEY, D.V.M.; PETER H. CRAIG, V.M.D.; W. H. RHODES, V.M.D.

Philadelphia, Pennsylvania

MOST CASES of osteoarthropathy in dogs are associated with primary or secondary neoplasms in the lungs. This case report deals with a male Boxer, 8 years old, which was briefly discussed in an addendum of a recent paper.³

On Nov. 10, 1956, this dog was referred to the clinic of the School of Veterinary Medicine, University of Pennsylvania. The present illness had begun four weeks previously and was characterized by persistent fever and a serous nasal discharge. The condition was originally diagnosed as a viral infection. The dog did not respond to therapy and, after three weeks, a swelling of the carpal and tarsal joints and a copious mucoid conjunctival discharge were noticed. Appetite and eliminations were normal, although the dog had lost weight since the onset of illness.

The dog was in poor physical condition, with marked thickening of the limbs distally and a moderate degree of joint enlargement. The temperature was 103.8 F., pulse rate 144, and respiratory rate 20. The legs were hot and pressure on any point below the elbow or knee joints resulted in pain. A blood count taken on the day of initial examination revealed a normal erythrocyte count (7,010,000/cmm.) and hemoglobin level (15.3 Gm./100 ml.). The leukocyte count was 26,700/cmm. with 95 per cent of the cells being mature neutrophils and 5 per cent lymphocytes. The

urine specific gravity was 1.010 and there was a trace of albumen. The rest of the urinalysis findings were normal.

A radiograph of the right foreleg demonstrated irregular periosteal new bone



Fig. 1—Preoperative lateral radiograph of the right foreleg of the Boxer showing the changes of hypertrophic osteoarthropathy. Notice periosteal new bone formation along the ulnar diaphysis (arrow) and to a lesser extent along the diaphysis of the radius. There is also marked thickening of the surrounding soft tissues.

Associate in veterinary surgery (Brodey), instructor in veterinary pathology (Craig), and instructor in veterinary radiology (Rhodes), School of Veterinary Medicine, University of Pennsylvania, Philadelphia.

The authors thank Dr. A. A. Liebow of the Department of Pathology, Yale University, School of Medicine, for the description of the gross and microscopic pathology in this case.

formation along the entire diaphyseal length of the radius and ulna, especially on the distal third of the ulna (fig. 1). There was also diffuse thickening of the soft tissues of the extremity. These findings are typical of hypertrophic osteoarthropathy.

A lateral radiograph of the thorax revealed an ovoid density superimposed on the cardiac shadow, while a dorsoventral view (fig. 2) showed this to be a large oval mass in the right mid-lung field. No other parenchymal lung lesions were seen at this time.

The dog was operated upon on the day of admission. It was anesthetized with intravenous pentobarbital sodium and given a transfusion of whole blood. An incision, through the right fourth intercostal space, revealed a large flattened neoplasm in the apical lobe, along with a large neoplastic bronchial lymph node. There were also multiple tiny subpleural tumor nodules (1 to 3 mm.) scattered throughout the remaining lobes of the lungs. The large lung tumor and the involved regional node were removed to see what effect ablation of this lesion would have on the osteoarthropathy.

The excised, flat and circular neoplasm, measuring 6.3 by 5.6 by 2.0 cm., surrounded a secondary bronchus which arose

from the main apical lobe bronchus. The center of the tumor was necrotic but the periphery consisted of firm gray tumor tissue.

The bronchial lymph node was 2.5 by 8.0 by 2.0 cm. and was firm and gray. The histological diagnosis was adenocarcinoma of the lung, with metastases to the regional lymph node and lungs.

There were no postsurgical complications; the temperature was normal the day after thoracotomy. By the fourth day, the heat and pain were gone from the limbs and by the seventh day the soft tissue swelling had completely regressed. When the dog was discharged from the hospital on the eighth day, there was no lameness, although the periosteal changes remained unaltered.

When the dog was returned, seven weeks after the operation, the owner stated that it had appeared normal the first week at home but had then become stiff in the legs and lethargic. By the third week at home, all the legs were again swollen and the degree of swelling varied from day to day. No respiratory changes were observed. The dog's urine developed a strong ammoniacal odor.

On Jan. 12, 1957, nine weeks after surgery, the arthralgia and limb swellings



Fig. 2—Preoperative dorsoventral radiograph of the thorax of the Boxer. Notice the large oval density in the right mid-lung field.

were more severe but there were still no abnormal respiratory signs. The most pronounced thickening of the legs was in the radiocarpal area, particularly on the right side.

Radiographs taken Feb. 2, 1957, just before euthanasia, revealed multiple rounded densities up to 1.5 cm. throughout the lung fields (fig. 3). These findings were compatible with a diagnosis of diffuse pulmonary metastases. The serum alkaline phosphatase level was 39.2 Bodansky units (B.U.) just prior to euthanasia (table 1).

NECROPSY REPORT

The anterior mediastinum and precardial fat were studded with nodules up to 1.5 cm. in diameter. These lesions were pale pink with dull orange foci of necrosis. A few minute nodules were found on the right parietal pleura. All pulmonary lobes contained many nodules ranging up to 2.5 cm. in diameter—some umbilicated, others hemorrhagic. In the left diaphragmatic lobe, the lesions became confluent. The tracheobronchial nodes of both sides were enlarged. Except for a slight thickening of the right ventricular wall, the heart was normal.

The posterior half of the greatly enlarged right kidney (14 by 8 by 8 cm.) was a tense, thin-walled fluid sac, but the anterior half was solid. When incised, this anterior portion was partly translucent and pink; other areas were yellowish and soft or fibrous. Near the anterior pole there were outlines of a markedly thinned cortex and almost totally atrophied fibrotic pyramids. The residual cortical tissue lacked its usual vascular pattern because of infiltration by a homogeneous, partly firm, yellowish white tumor tissue. The posterior, cystic half of the kidney consisted of a thin sheet of fibrous connective tissue in which could be seen remnants of renal structures. The pelvis terminated blindly just proximal to the ureter in



Fig. 3—Lateral radiograph of the Boxer's thorax taken just prior to necropsy. Notice the many nodules scattered throughout the lung parenchyma. The linear density (arrow) anterior to the heart is a catheter in the anterior vena cava. A small broken segment of this catheter tip can be noted.

which there appeared to be a stricture. Distal to this obstruction, the ureter appeared normal.

The right para-aortic lymph nodes were greatly enlarged and formed a confluent mass (8.0 by 3.5 cm.) which, on cut section, resembled the thoracic lymph nodes. The left kidney was compensatorily hypertrophied and showed no metastatic lesions. The other abdominal viscera were normal.

The skin covering the legs was unusually adherent to underlying structures, particularly near the distal extremities of the humerus, femur, radius, and ulna, by a boggy dull white tissue which was in direct contact with the periosteum. The periosteum itself was immensely thickened and ap-

TABLE 1—Miscellaneous Data, Blood Gas Analyses, and Arterial Pressure of Boxer with Osteoarthritis

Miscellaneous data	Blood gas analyses*		Arterial pressures**	
Length (nose-tail) 87 cm.	Femoral arterial O ₂	17.4 vol./100 cc.	Pulmonary arterial	25/15
Weight, 40.5 lb.	blood content		pressure (mm. Hg.)	
Acid phosphatase 0.5 B.U.	Femoral arterial O ₂	90.3/100 cc.	Femoral arterial	150-160
Alk. phosphatase 39.2 B.U.	saturation		pressure (mm. Hg.)	
	CO combining capacity	19.27 vol./100 cc.		100-110
	femoral arterial blood			

*Subject not anesthetized. **Subject anesthetized, 30 mg./kg. pentobarbital sodium.

These data were obtained by Dr. A. A. Liebow of the Yale University School of Medicine, New Haven, Conn.

peared as an encrustation which was ossified in its deeper parts, particularly near the elbow and carpal joints. The most striking periosteal changes occurred in the radius and ulna which were enclosed in a layer of osseous tissue varying from 1 to 5 mm., in some regions exceeding the width of the cortical bone. The inner layers of this newly formed bone were yellow; the outer portions were pale pink.

MICROSCOPIC FINDINGS

Numerous nonencapsulated nodules of atypical epithelial tissue were found throughout the lung parenchyma and on the visceral pleura. In many nodules, the accumulated epithelial cells were apparently free in the alveoli or else were attached to the interalveolar septa. The cells were uniform in size and occurred in rounded masses separated by thin laminae of vascular connective tissue. In many places, well defined acini were formed. The cells themselves were, in part, composed of a finely granular cytoplasm and of roughly spherical, finely stippled nuclei. In other cells, there was distinct cytoplasmic vacuolation.

Numerous mitoses were seen, many of which were tripolar or otherwise atypical. In some places the connective tissue stroma of the nodules contained many plasma cells. Many of the larger

nodules contained central areas of necrosis which were infiltrated with polymorphonuclear leukocytes. This microscopic picture was identical to that seen in the surgical specimen removed initially.

The picture in the right kidney resembled that seen in the lung nodules. Here, however, the masses of atypical epithelial cells were arranged in a tubular pattern. These masses penetrated from the cortical substance to the pelvis. Only a few widely scattered nephrons were seen within a fibrous connective tissue which contained many lymphocytes. The glomeruli were enlarged but partly replaced by connective tissue and the associated atrophic tubules were lined by flattened epithelium supported by a thick basement membrane. Much of the kidney tissue was replaced by fibrous or partly necrotic tissue. The blood vessels of the kidney were thick-walled and had small lumina. Masses of tumor cells were found within some of these blood vessels. In other areas, this intravascular tumor tissue was necrotic and partly organized.

The para-aortic lymph nodes were replaced by masses of partly necrotic tumor tissue. The epithelial cells were similar to those described in the lungs and right kidney. Several small venules in the region of the nodes were filled with tumor cells.

Skin sections, taken from over the radial and ulnar lesions, showed the corium with its usual

Sections from Metastatic Lesion in the Boxer's Lung that Was Surgically Removed

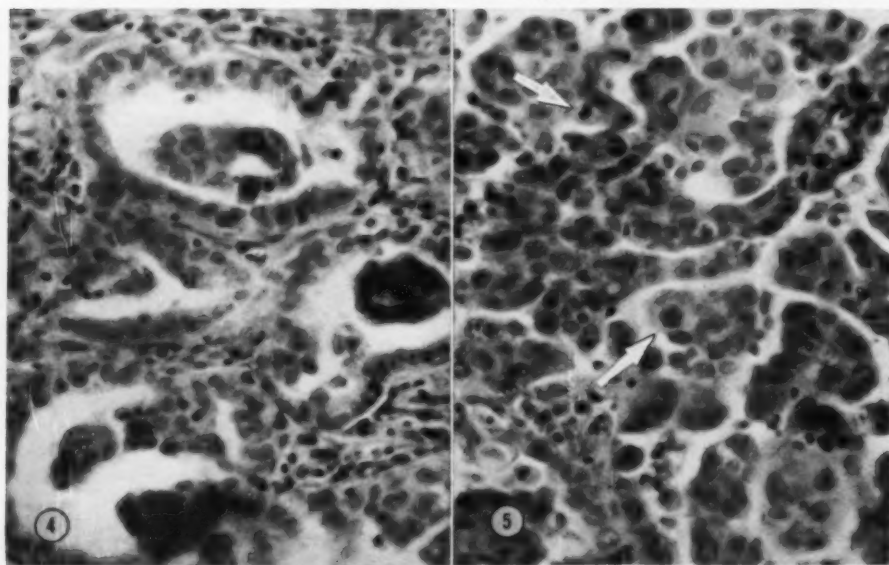


Fig. 4—Neoplastic tubular formations with variably distinct basement membranes and intratubular papillary growths.

Fig. 5—The cells are grouped in cords and masses. Notice cellular anaplasia and mitotic figures (arrows).

structure of well-defined bundles of collagen surrounding the hair follicles, but in the deeper tissues, intermingled with some fatty tissue, there was an accumulation of much denser hyaline connective tissue. In this area could be seen a large twisting network of anastomosing blood vessels. These expanded blood channels were probably supplying the newly formed osseous material. The skin from a section of foot pad of the same extremity was normal in appearance.

A transverse section of the radius and ulna was studied, together with the interosseous membrane and surrounding tissues. These bones had become altered remarkably. Superimposed upon the outer aspect of the dense cortical bone were newly formed trabeculae which were separated by much wider spaces than in the true cortical substance. These spaces contained loosely arranged connective tissue and blood vessels. External to these newly formed trabeculae, and directly associated with the periosteum, the bone again became extremely dense, even denser in arrangement than the cortical substance. This bone had a characteristic ridged appearance, with the ridges more prominent in some places than in others. Superficial to this area, there was compact fibrous tissue in continuity with the densely arranged periosteal substance. The cavities of the large bones contained adipose tissue, together with irregularly calcified material which lacked the structure of bone.

The histological diagnosis was primary renal adenocarcinoma, with metastases to the para-aortic and thoracic lymph nodes and lungs, associated with hypertrophic osteoarthropathy. Thus, the tumor removed at lobectomy was considered to represent a metastatic lesion from the primary renal neoplasm.

DISCUSSION

This case presents several interesting facets. Few, if any, cases of osteoarthropathy in the dog have been reported in relation to pulmonary metastases from a primary renal carcinoma. In the past few years, we have observed 2 other dogs which had extensive lung metastases arising from primary carcinoma of the kidney but neither of these animals had osteoarthropathy.

While we have not determined the exact alkaline phosphatase ranges for dogs of various ages and breeds, it is well known that this level in growing animals is considerably higher than in mature animals. In recent studies of the serum alkaline phosphatase levels in the dog, one group⁷ reported a value below 2.0 B.U. in the majority of the 18 dogs examined; another group¹ found a range of 1.7 to 7.4 B.U. with a mean value of 4.1 B.U. in 61

dogs; and a third observer² recorded a range of 3.0 to 6.0 B.U. However, they do not mention the ages of the animals studied.

The extremely high serum alkaline phosphatase level in this case (39.2 B.U.) is probably unrelated to the osteoarthropathy *per se*. We recently observed a 3-year-old male Collie with bronchiectasis and osteoarthropathy which had far more extensive periosteal changes than this Boxer, yet its alkaline phosphatase level was only 4.5 B.U. It is possible that this high phosphatase value of 39.2 B.U. is related to the renal neoplasm.

In an experimental study of splenic and renal infarctions due to bacterial endocarditis and vascular ligations,⁷ it was demonstrated, histologically, that the alkaline phosphatase concentration (normally high in renal tissue) was markedly depleted in the infarcted areas. Concomitant with the development of the infarctions, there was a significant rise in the serum alkaline phosphatase levels. This rise in the serum levels was believed related to absorption of alkaline phosphatase from the infarcted areas. In this Boxer, a similar situation might have existed; i.e., a marked depletion of the alkaline phosphatase in the tumorous kidney with a subsequent rise in serum levels of this enzyme.

While the soft tissue changes and arthralgia in this Boxer regressed after removal of the large metastatic lung tumor, they recurred two weeks later, probably in relation to the rapid growth of the many other lung nodules. In man, osteoarthropathy waxes and wanes with the activity of the underlying disease process. In this dog, the day-to-day variations in the limb swellings, reported by the owner postsurgically, may have resulted from hemorrhage, necrosis, or inflammation within the rapidly growing tumor nodules. The osteoarthropathy probably was initiated by the large metastatic apical lobe tumor and was continued postsurgically by the many metastatic nodules in the lung as they continued to increase in size and number. The presence of a large necrotic area within the excised tumor undoubtedly resulted in the preoperative fever and leukocytosis and may have played a role in the pathogenesis of the osteoarthropathy.

A reviewer⁶ of this subject concluded that the most important factor in the development of osteoarthropathy in man is

an increased vascularity, particularly in the terminal arterioles. He felt that this increase in the blood flow per unit of tissue in the case of simple clubbing (primarily a thickening of the fibroareolar tissues of the digits) is due to an increased digital arterial pressure. In this Boxer, the skin temperature of the limbs was increased and the connective tissues deep to the corium contained numerous expanded vascular channels. Both of these findings indicate that there was an increased blood flow to the extremities of this dog.

In three reported cases of osteoarthropathy in man, secondary to bronchogenic carcinoma, the osteoarthropathy regressed after resection of the lesion.⁶ In one other case, the operation was stopped after extensive dissection of the hilum, as the tumor proved to be inoperable. Although no vessels were ligated, the arthralgia vanished, as in the previous cases. It was suggested that the hilar neurectomy caused this regression.

In two cases of bronchogenic carcinoma in man, ligation of one of the pulmonary arteries alone caused immediate relief of the arthralgia.¹⁰ The theory that anoxia was the cause of osteoarthropathy was discounted since ligation of one pulmonary artery brought about regression of the osteoarthropathy. Others⁵ thought that this regression of osteoarthropathy was not due to the pulmonary artery ligation but primarily to clearance of the hilar area with severance of nerve fibers. The vagal branches entering the hilum on the affected side were severed in two patients with bronchogenic carcinoma and osteoarthropathy; in three other patients with

inoperable lung cancers and osteoarthropathy, the hilum was not disturbed but the vagus nerve on the side of the tumor was sectioned. In all instances, there was dramatic and permanent regression of the arthralgia, joint effusions, and subperiosteal proliferations, indicating that this syndrome was caused by a neural reflex passing from the affected lung in the fibers of the vagus nerve.

Considering the distinct relationship between the limb lesions and those in the lung, it seems appropriate to either incriminate or rule out hypoxemia as a significant pathogenic factor. It may be hypothesized that physiological vascular shunts develop around certain pulmonary lesions. The mixed venous blood passing through these shunts reaches the systemic circulation without contacting aerating alveoli. The obvious result is arterial hypoxemia of varying degree. Indeed, one investigator⁹ produced hypertrophic osteoarthropathy in 1 dog by anastomosing the pulmonary artery to the left auricle, thus simulating the cyanosis of congenital heart disease.

It may be speculated that eradication of the primary lung lesion (by surgical, medical, or roentgen therapy) causes regression of this syndrome, because such eradication eliminates the shunt and allows return of arterial oxygen saturation to normal levels. The remarkable effect of unilateral vagotomy in human cases could be due to a loss of parasympathetic tone with subsequent constriction of the shunt arterioles. The effect of pulmonary artery ligation on osteoarthropathy could also be due to elimination of an intrapulmonary shunt mechanism in the affected lung, with re-

TABLE 2—Cardiac Output of Normal Boxer and One with Osteoarthropathy

Dogs	A O ₂ consumption	B Femoral arterial O ₂ content (vol./100 cc.)	C Mixed venous O ₂ content (vol./100 cc.)	D Cardiac output (cc./min.)
Osteo-A	123.7	20.45	13.05	1,671
Boxer				
Control	103.0	18.75	15.35	3,029
Boxer				

COMPARISON OF FEMORAL VEIN AND MIXED VENOUS BLOOD DESATURATIONS

	E Femoral arterial O ₂ content (vol./100 cc.)	F Mixed venous O ₂ content (vol./100 cc.)	G Femoral venous O ₂ content (vol./100 cc.)	H Mixed venous saturation (%)	J Femoral venous saturation (%)
Osteo-A	20.45	13.05	16.75	63.7	81.6
Boxer					
Control	18.75	15.35	17.20	81.9	91.6
Boxer					

*All determinations made while subjects were anesthetized (30 mg./kg. pentobarbital sodium), and while subjects breathed 100 per cent O₂ atmosphere. Calculations according to the following formulae: $D = A/B - C$, $\times 100$ $H = F$; $E, J = G/E$.

turn to normal arterial oxygen saturation. It must be emphasized that hypoxemia commonly exists without clinical evidence of cyanosis.

However, many chronic hypoxemic states in both man and dog are not accompanied by hypertrophic osteoarthropathy. Future aims include a study of unilateral vagotomy in canine cases of osteoarthropathy and the evaluation of blood or tissue hypoxia and its relationship to the other, as yet unknown, pathogenic factors.

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Dart Gun Tranquilizers.—A new dart-type gun, a carbon dioxide rifle which shoots a syringe-loaded dart up to 40 yards, was recently demonstrated by Dr. F. B. Hayes of the University of Georgia. In addition to the nicotine compounds previously reported, a new phenothiazine type of tranquilizer, DiQuel, was used. The drug was designed by Jen-Sal Laboratories exclusively for use in the veterinary field and has been approved by the Food and Drug Administration for use on livestock. The normal dose in cattle is effective for two or three days.—*Nat. Provisioner* (Dec. 28, 1957): 13.

Research on Bloat in New Zealand

Clinical research on bloat in cattle has been hampered because of the difficulty of producing it experimentally. However, in New Zealand, bloat can be produced in stall-fed animals. Investigations with bloat-prone, identical twin cows indicates that bloat is not related to the rate or amount of herbage eaten, to weather conditions, to succulence (clovers cause it at all stages of growth), or to rumen activity (eructation and contractions appear to be increased). The tendency to bloat seems to be inherited (there are similarities in identical twins). The rumen content is more frothy in bloat-prone animals than in others, even before feeding.

The only reliable agents for prevention and treatment are vegetable, mineral, or animal oil and fats, and certain synthetic agents. Drenching with oil prevents bloat but for only one feeding. Emulsified oils can be sprayed on pasture (2 to 4 oz. per cow per day) to prevent bloat. Of the other agents, some are harmful and silicons are unreliable since they do not mix through the rumen ingesta. Penicillin acts by slowing fermentation and gas production so that they do not reach a peak. However, this results in an accumulation of the proteins which are released from the plants and which, by strengthening the foam, seem to be important factors in bloat—even more so than saponins. The continuous use of penicillin may develop resistance to this treatment.

Proneness to bloat might be due to anatomical differences in animals but is more apt to be due to differences in foam-causing factors such as the mucoprotein in saliva and the quantity of saliva secreted and swallowed.

The pH of rumen liquid must fall to 6.3 for bloat to occur, with the maximum foam strength being at about 6.0.

Thus, bloat probably results (1) from the vigorous fermentation which produces gas and fatty acids which lower the pH of the rumen; (2) from the additional gas produced when the bicarbonate of the saliva mixes with the fatty acids; and (3) from the release of the proteins and saponins which form a stronger foam. Further research is needed. In the meantime, we should rely on good pasture management and use oil or penicillin as a last resort only.—A. T. Johns *et al.* in *New Zealand Vet. J.* (Dec., 1957): 115.

Successful Method of Destroying Large Numbers of Turkeys Under Field Conditions

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ON MAY 28, 1957, the Oregon Department of Agriculture, Division of Animal Industry, found it necessary to destroy a flock of turkeys consisting of 2,349 breeder hens and 278 breeder toms, approximately 13 months old, due to ornithosis infection which did not respond to heavy and prolonged antibiotic therapy. The hens averaged just under 19 lb. and the toms 38 lb., live weight.



Fig. 1—Photograph showing a 100- by 18-ft. ditch used for the destruction of a large group of turkeys. The top of the trench was strutted with boards to hold the plastic covering.

Fig. 2—A temporary wire runway led from the turkey pens directly to the open end of the ditch. Note the manual counter used as the birds entered the ditch.

Many methods of euthanasia were considered, some of which might have been quicker in action but which presented hazards to the personnel involved in such a procedure. It was decided, because of the sandy nature of the soil in that area (Sauvies Island, north of Portland), that

the birds could best be destroyed in covered ditches, using carbon monoxide as the lethal agent.⁶

The owner of the flock used a bulldozer with a 10-ft. blade to excavate two ditches, grading to either end. The first ditch was 100 by 18 ft. in dimension and 8 ft. deep with perpendicular sides (fig. 1). The second ditch was similar but smaller, approximately 90 by 14 to 15 ft. One end of the first ditch was blocked with a semisolid wooden gate. The gate was reinforced by placing steel fence posts to prevent pressure of the flock pushing it out of position. The top of the trench was then strutted with 20-ft. 2-by-8's spaced approximately 8 ft. apart the full length of the ditch. The ends of the 2-by-8's were recessed flush with the surface of the ground. Next, 2-by-4's were laid on top of the 2-by-8's, to divide the length of the ditch in thirds (fig. 1).

This created a support for a polyethylene sheet, 0.004 gauge, 20 ft. wide, and 100 ft. long. Before the plastic sheeting was placed, a standard heavyweight tarpaulin was suspended from the top struts over the end bulkhead. This came in contact with the ground so that a dirt seal could be shoveled on top of the base of the tarpaulin. This created an airtight bulkhead at one end of the ditch.

Temporary wire runways (fig. 2) were constructed leading from the large turkey pens directly to the open end of the ditch so an accurate count could be made as the birds were driven into the ditch. This was necessary because the department had to indemnify the owner as the birds were destroyed, at the insistence of its Division of Animal Industry.

Using manual counters, one man counted the hens passing through the narrow runway while a second counted toms. When the first ditch was filled (1,248 birds) (fig. 3), another bulkhead was put into place at the open end (fig. 4) and sealed similarly

From the Oregon Department of Agriculture, Salem. The authors thank Drs. E. M. Dickinson, M. A. Holmes, and O. J. Halverson for their assistance and suggestions; and Miss Genevieve Morgan for photographs.

⁶Only three departmental employees were needed to assist the owner and a helper in carrying out this destruction. Additional personnel from other agencies were present as observers.



Fig. 3 and 4—After the ditch was filled, another bulkhead was constructed to seal the open end.

to the first end. Next, plastic sheeting was stretched tightly over the bridging (fig. 5) and the edges sealed with a layer of dirt.

Three automobiles were backed up to the sides of the ditch and exhaust pipe extensions, using neoprene flex hose of 2-inch diameter, were connected (fig. 6) extending down into the ditch for a distance of 2 to 3 ft. The motors were started and the time recorded. This first group of turkeys was destroyed in 20 minutes (fig. 7). While the birds were evidently dead at the end of ten minutes, it was believed advisable, as a safety factor, to continue applying carbon monoxide for another ten minutes.

The second ditch was somewhat smaller so the 1,379 remaining birds were crowded into it more tightly, and the closing bulkhead placed somewhat closer to the opposite end to reduce the air space and hasten destruction of this group of birds. The birds were then occupying an area approximately 15 ft. wide and 70 ft. long. All of these birds were dead within eight minutes but gas was continued for another ten minutes.

The operation was considered entirely successful; the birds did not become excited, no struggling ensued, euthanasia was rapid, and the kill was 100 per cent. When examined, only 1 or 2 birds in each ditch had been injured in the operation. This was probably due to the crowding.

The foregoing program is recommended for destruction of large numbers of poultry without any direct handling where infectious or contagious diseases may be present.



Fig. 5—Plastic sheeting was stretched over the bridging and the edges were sealed with a layer of dirt.



Fig. 6—Close-up of exhaust extension to trench with gas being applied.

Fig. 7—There was complete destruction of turkeys 20 minutes after gas was applied.

After removing the struts and bridging, the plastic sheeting was dropped into the second ditch as it was impractical to attempt disinfecting it for use in other procedures. The nominal cost of only \$37 for the 2,000-sq. ft. sheet was charged to the operation, along with the indemnity to the owner.

The birds in both ditches were covered with quicklime and the ditches filled by the bulldozer.

The entire operation took only five hours, most of which was devoted to driving the turkeys from the five different pens into the counting runways, herding them into the ditches, and transferring the bridging from one ditch to the other.

More difficulty was incurred in getting the birds into the second ditch where the runway was curved and wide, whereas the first ditch had a narrower, straighter runway and a more sloping entrance so that the birds were not forced to descend a steep grade. These factors are considered important in herding turkeys into such a ditch.

CONCLUSIONS

In destroying large numbers of turkeys or other domestic fowl, certain preparations should be observed:

- 1) Have a covering for the ditch at least 6 ft. wider and 20 ft. longer than the area to be covered. This will allow for anchoring and will assure a tight seal.
- 2) Provide a straight runway, as narrow as possible, and tapering toward the open end of the ditch.
- 3) Provide a gently sloping ramp into the ditch; this is essential.
- 4) Do not attempt to "double deck" the birds. Turkeys will strenuously resist being driven over the carcasses of the first group destroyed unless they are well covered with dirt. It is much easier to use a second ditch.
- 5) Finally, it seems inadvisable to attempt to destroy more than 1,200 to 1,500 birds in one ditch, as the largest practical covering that it is possible to handle, even on a calm day, is 2,000 sq. ft. The width of the trench should be no greater than described since, in spreading the sheeting, it is necessary for some of the men to walk out on the 2-by-8's in order to tighten the sheeting.

The Camel and Water.—A camel kept in the summer sun for 17 days (av. max. temp. 100.4 F.) lost 37 per cent of its initial body weight but recovered without ill effects. A donkey would have died after four days; man on the second day. Camels maintain their appetites as long as their water loss is less than 20 per cent. Other animals soon lose their appetites when deprived of water. When water was restricted in the summer, the camel's rectal temperature fluctuated 11 degrees daily (94 to 105 F.); when water was plentiful, the fluctuation was 3.6 to 5.4 F. daily.—*Nutr. Rev. (Jan., 1958): 12.*

Hibernation Not Dependent on Temperature.—A ground squirrel, kept at a constant temperature (35 F.), and with 12 hours of light daily for two years, has alternately hibernated and been active at the usual seasons. Other squirrels responded similarly but use of an exercise wheel postponed hibernation for a month without shortening it. Withholding food resulted in earlier hibernation.—*Nature (Dec. 14, 1957): 1371.*

Canine Hepatitis Virus Propagated in Pig Kidney Tissue.—Previous attempts to propagate infectious canine hepatitis virus in embryonating eggs, mice, rabbits, and in other animals than dogs have been unsuccessful. After continuous passage in canine kidney tissue culture, this virus was propagated in porcine kidney epithelial cells. Inoculation of 14 susceptible dogs with nineteenth and thirty-fourth passage of this porcine culture resulted in no signs of illness but in immunity to this disease. Apparently, the vaccine could be made from either canine or porcine kidney tissue cultures.—*Science (Jan. 17, 1958): 140.*

The American buffalo looks heavy but the largest bull in a large Oklahoma herd, a 6-year-old, weighed 1,590 lb. The heaviest cow, an 8-year-old, weighed 1,020 lb. The average dressing percentage was 54.—*Wisconsin Agric. (Feb. 1, 1958): 10.*

A Prolific Ewe.—A 5-year-old Columbian ewe, in Oregon, recently gave birth to 6 lambs; 4 survived.—*Chicago Daily News (Jan. 16, 1958).*

Handy Surgical Techniques

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The following are surgical techniques found to be of value in my practice.

Use of the Metal Detector in Rumenotomy

Since the reticulum commonly contains more than one piece of metal, it is often difficult to find the piece which is causing the trauma. In order to dispense with the time-consuming, fold-by-fold search of the mucosa of the reticulum, the metal detector is now used after each item is removed, to learn if other metal objects remain. It is of interest that, since having started this procedure, the percentage of recovery has increased and operating time has decreased. The feeling of having done a complete job is most satisfying.

A Simple Method to Repair the Torn Uterus of the Cow

In a difficult parturition in the cow, the uterus is often torn. A transverse tear just ahead of the cervix on the ventral surface, which extends for variable distances up the lateral walls of the uterus, is one of the most difficult for adequate surgical repair. Since this condition is commonly found in practice, due to the efforts of the ranchers to deliver calves, a new type of surgical repair has to be developed.

The basic principle of the operation is to obtain a continuous tract extending from the uterus to the vagina, to insure proper drainage of the uterus during the period of its involution. Since it is impractical to attempt to reunite the torn edges of the uterus anterior to the cervix, I conceived the following method.

Using a miner's type of lamp mounted on the head or hat to light the field, and with the owner holding the labia of the vulva open with two towel forceps, insert one hand and grasp the anterior (distal) edge of the torn uterus near the middle of the tear and draw it as far as possible into the vaginal tract. A mattress type stitch, using heavy umbilical tape, is placed through this torn uterine edge to be used as a stay suture to hold the uterus in an

advantageous position. Several interrupted sutures of No. 2 plain catgut are placed through the uterus and vaginal wall to secure the uterus to the floor of the vagina just posterior to the cervix. The umbilical tape is then removed and an antibiotic ointment is spread freely over the sutured surface and forward into the uterus. To help control infection, 3 million units of penicillin are given intramuscularly, daily for three days.

The owner is always advised to ship the cow to market the following fall; however, in 1 case when this was not done, the cow produced a calf normally the next year.

Surgical Correction of Torsion of the Uterus in the Cow

After trying every recommended method for the correction of a torsion of the uterus in the cow, a simplified surgical technique has been developed which can be completed quickly and which has been effective in all cows on which it has been used.

The hair is clipped from the lumbar fossa area of the left flank. After cleaning and disinfecting the area thoroughly, a 2 per cent procaine solution is used for local infiltration of a 9-inch transverse line in the posterior one fourth of the fossa, infiltrating the skin and all layers of muscle. It is possible to use the paralumbar block but most of the cases encountered have been in Hereford cattle in which the heavy muscles of the back make this technique difficult.

The skin and subcutaneous layers are incised but the external oblique muscle need not be cut since it can usually be separated with the finger tips. In some cases, it is necessary to incise all the layers of muscle. All bleeding vessels should be ligated before the peritoneum is penetrated. After entering the peritoneal cavity, pass the hand well under the calf in the uterus. Using care not to penetrate the uterine wall with the finger tips, grasp some angular prominence of the calf and rotate the entire uterus clockwise. An assistant should place his hand in the vaginal tract in order to inform the operator as to the progress he is making in the rotation. When enough rotation has been accomplished for the assistant to grasp the feet of the calf, he can help complete the rotation. Uterine inertia is common after a torsion has been corrected, so it is usually

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necessary to resort to forced extraction to complete the delivery.

The openings in the peritoneum and the muscle layers are closed separately with a continuous suture of No. 1 plain catgut. The skin is closed with interrupted mattress sutures of heavy grade Vetafil.* A 1½-inch space is left unsutured at the ventral end of the skin incision for drainage. The incision is coated with an antibiotic ointment and the cow is given 3 million units of penicillin. No complications have been encountered in this procedure.

Electronic Ejaculator for Minor Surgery on the Penis

Many tumors of the penis are well pedunculated and relatively simple to remove once a protrusion of the penis is obtained. The electronic ejaculator has been used with a high degree of success in maintaining protrusion during such operations.

Frequent use of the ejaculator in testing bulls has provided excellent opportunities to observe its effect upon the bull. Since no 2 bulls react exactly alike, in most cases it is necessary to adjust the amount of power which is used, as well as the rapidity with which this power is applied, in order to obtain a protrusion of the bull's penis. When the power is applied and the penis is protruded, the bull will not attempt to kick or object to manipulation of the penis. Since pedunculated tumors are most frequently attached near the anterior end of the penis, they will stand out when erection is obtained, making the point of surgical removal easily accessible to the operator.

It is necessary that the operator of the ejaculator be experienced in order that he may retain the proper degree of erection during the surgical removal. The tumor is removed with serrated surgical scissors.

Profuse hemorrhage usually follows removal but will stop spontaneously in ten to 15 minutes if the bull is in normal health. Penicillin (3 million units) is given daily for three days to aid in control of infection.

This same procedure has been used in treating wounds and ulcers of the penis. All operations are followed by the application of a good antiseptic ointment.

By the use of this method, several bulls

can be examined in the same time it formerly required to give a local nerve block to 1 animal.

Enzootic Metritis of Sows

Of 44 parturitions in two years, in a herd of swine in Australia, 11 were complicated by metritis, resulting in a loss of 12 per cent of the pigs (50% of affected litters) due to agalactia. Tests for brucellosis were negative, but 2 of the original 3 sows reacted (1 to 100 plus) to *Leptospira pomona*. Some vaginal swabs and one retained afterbirth produced streptococci and other organisms.

The infection was apparently introduced by a boar, since a few of the sows showed a vaginal discharge and vulvar enlargement ten days after service. All affected sows had temperatures of 105 to 107 F. and discharged a purulent odorless liquid for three or four days. The mammary glands were normal but contained little milk. There were no abortions. Treatment with penicillin or terramycin seemed to be beneficial.—*Austral. Vet. J. (July, 1957): 181.*

A Strange Intestinal Obstruction in a Dog.—A Retriever, 4 months old, had been vomiting for a week. A mass could be palpated in the abdomen, but a radiograph failed to show a foreign body, suggesting an invagination of the ileum.

Upon laparotomy, the entire small intestine was folded like a curtain on its rod, or like an accordion in repose, to the middle of the ileum. Incision of the ileum revealed the end of a cord imbedded in a mass of bone particles and herbs, but the other end of the cord could not be drawn through the pylorus of the stomach. Its removal, because of an egg-sized knot, required an incision in the stomach. The patient was fed 48 hours after surgery and gained 2 lb. in the following week.—*Jean Lamouroux in Bull. Acad. Vét. France (May, 1957): 191.*

Fertility Results with Frozen Semen.—In a "split-ejaculum" study, frozen semen from 5 bulls showed no significant decline in fertilizing capacity when stored at -79 C. for seven days, six months, one year, and two years.—*J. Dai. Sci. (Dec., 1957): 1650.*

*Vetafil is produced by Bengin and Co., Hannover, West Germany. Supplied by Dr. S. Jackson, Washington, D. C.

Bovine Malignant Catarrhal Fever. I. Its Occurrence in Michigan

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BOVINE MALIGNANT catarrhal fever (MCF) has a world-wide distribution; it has been reported from the continents of Europe, Africa, South America, and North America.¹¹ It was first reported in the United States by workers in Pennsylvania, in 1920,⁹ and has since been reported from Ohio,⁴ North Dakota,¹⁰ Colorado,³ New York,¹² and Michigan.¹

Hutyra *et al.*⁷ state that

"The disease has been observed and described from the end of the eighteenth century. . . . Anker (1832) described it as a typhus of cattle and regarded it, with Spinola, as originating from benign nasal catarrh. . . . Haubner and Roll, and later Lucet, described it as a diphtheroid infection of the mucosa, but it was first described as a specific infectious disease of cattle by Bugnion in 1877."

INCIDENCE OF THE DISEASE

Previous investigators have observed the greatest seasonal incidence of the disease in the United States during the spring and fall.^{8,10} In Pennsylvania, an outbreak was described in one herd of cattle in which the disease developed from December through June.⁹ A report from Colorado³ states that the disease may occur during any season, but most often during the winter and early spring months.

In Michigan, of the 33 cases studied since 1954, the greatest incidence of the disease occurred during February and March, gradually declining through June. Only 3 of the 33 cases occurred in the fall. One practitioner in the heart of the MCF area² and an investigator¹³ have observed a correlation of the onset of the condition with the marked fluctuations of temperature during the late winter and early spring. Necropsies were done on 25 of the

33 animals and material was collected for microscopic examination. The other 8 animals are included because they presented classical pictures of the "head and eye" form of MCF occurring on farms with a past history of the disease. The majority of cases occurred in an enzootic area in southeastern Michigan.

Age, Breed, and Sex.—A report from Pennsylvania⁹ indicated that the most susceptible animals were those between 2 and 5 years of age. Our studies indicated that all age groups may be equally susceptible. The youngest animal affected was 4 months old. The disease has been distributed almost equally among animals in age groups of 2 to 5 years, 1 to 2 years, and 1 year or less. There seemed to be no particular breed susceptibility. Both dairy and beef cattle were affected. The disease was observed in females, males, and steers.

SIGNS OF THE DISEASE

The onset of the disease is sudden—no indications of impending sickness are seen. In lactating cows, milk production drops sharply to little or nothing. The animal eats and drinks poorly or not at all. A profuse mucopurulent exudate hangs from the nostrils (fig. 1, 3) and, in some cases, an accumulation of this material may be seen on the floor or in the manger. A characteristic nasal roar and severe dyspnea develop as the disease progresses. Distinct rattling sounds may be heard as exudates collect. The breath has a fetid odor.

During the early phase of the disease, a serous fluid which drains from the medial canthi of the eyes leaves swaths of matted hair as it courses ventrally over the face; after three to four days, this fluid becomes mucoid in nature and collects in the corners of the eyes. A peripheral corneal cloudiness usually begins on the first or second day, terminating in complete opacity and blindness in four to five days (fig. 2). This "frothing" of the cornea is a prominent feature of the syndrome. Marked episcleral injection is observed. The eyelids are often mildly swollen, with somewhat rounded margins.

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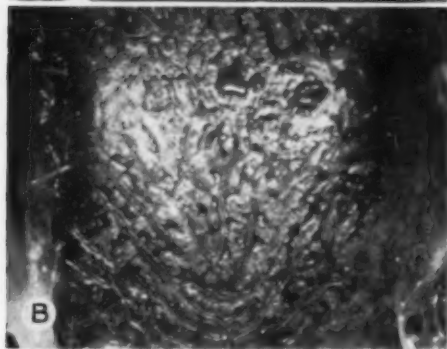


Fig. 1—Cow with head-and-eye form of malignant catarrhal fever (A); mucopurulent nasal discharge and thickening and cracking of the muzzle epidermis (B) in a cow with acute MCF.

The epithelium of the muzzle is at first slightly reddened; later, a thick crusting of necrotic epithelium and exudate may partially mask this change. If this thickened, cracked layer is dislodged, the raw red surface beneath (fig. 3) may bleed profusely. Gradually, the nasal epithelium sloughs in small patches. The anterior nasal mucous membrane is covered by a gray pseudomembranous layer which over-



Fig. 2—Eye of cow showing marked corneal opacity due to malignant catarrhal fever.

membrane. On examination of the oral cavity, one may find changes varying from a diffuse necrosis of the buccal mucosa to a macular appearance formed by small areas of erosion (fig. 4, 5, 6). A diphtheritic coating is found in some cases, but may have been washed away if the animal has been drinking.

The skin may provide certain features of diagnostic importance. The epidermis is dry, leathery, and folded as one would expect in a severely dehydrated animal; in addition, however, a characteristic tufting of the hair in small patches, particularly over the cervical region, has been observed in several animals. Localized thickenings of the skin underlie these tufts; occasionally small contiguous lymph nodes have been swollen. Raised circumscribed areas, approximately 5 mm. in diameter, have been observed on the udder. Patchy erythema may occur anywhere on the body but has been seen particularly on the udder and lips of the vulva. The teats may be ruborous early in the disease, followed by development of a characteristic thickening of the skin which is crisscrossed by deep fissures, exposing the subcutaneous tissue (fig. 7); dark brown scabs may develop on the teats and, less frequently, on the udder and vulva.

Temperature elevation to 106 F. occurs on the first two to three days of illness and gradually declines to a level of 103 to 104 F. on the fourth or fifth day.

The animals are commonly in a state of abject depression, standing motionless, with the head lowered and neck extended. Investigators have reported that some ani-

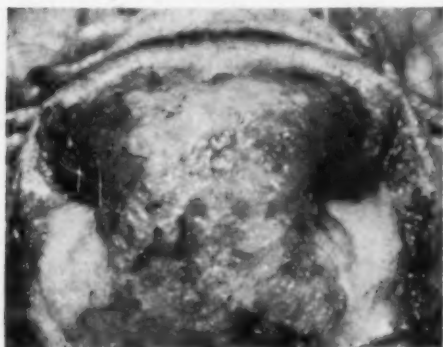


Fig. 3—Muzzle of cow with acute MCF showing extensive erosion of muzzle epithelium. Notice also the profuse nasal exudate.

mals, in which extreme excitement and viciousness occur, have attacked their handlers; but, in the cases reported in this study, only mild signs of such nervous excitement—marked uneasiness and shifting of the feet—were seen. Marked hyperesthesia was common but this is believed due to the inflammatory processes in the integument rather than a central nervous system disturbance.

Urinary disturbances, which may be present in some animals, are not a constant feature. Blood-tinged urine may be passed at the end of micturition, accompanied by straining and dribbling of the urine.

Forms of the Disease.—Four forms of the disease have been described: (1) peracute, (2) head-and-eye, (3) intestinal, and (4) benign.⁸ Several peracute cases have been diagnosed in Michigan; these run a course of two to three days. The majority of cases reported in this study were the head-and-eye form. The course of this form was generally four to 14 days, the most common duration being seven days. One case of the intestinal form was diagnosed on the basis of histopathological features.

A fifth type of MCF, designated "chronic," has been observed in Michigan (fig. 8). This type runs a course of up to six months or longer, terminating in death. Some of these animals may appear to be recovering. They begin to eat and drink but do not otherwise seem to improve or deteriorate until they have a sudden relapse and die; often large patches of skin will slough in the later stages. The benign form has not been recognized here.

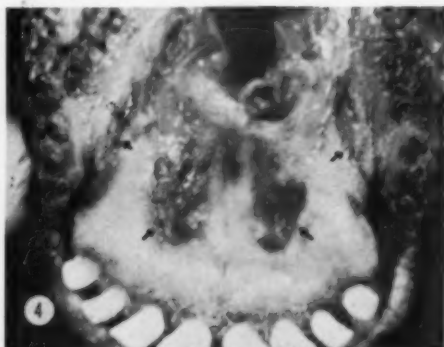


Fig. 4—Erosion (arrows) of the mucous membrane of the floor of the mouth and buccal mucosa in a cow with acute MCF.



Fig. 5—Mucous membrane of lower lip and gum of cow, showing patchy erosions (arrows).

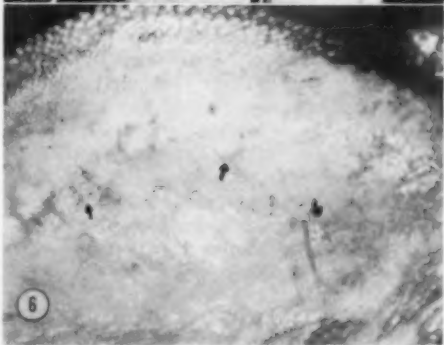


Fig. 6—Lateral surface of bovine tongue showing irregular erosions (arrows) of the mucous membrane.

It must be emphasized that atypical variations of the syndrome, previously described, were not uncommon. In a few animals, the corneal opacity was absent; in others, muzzle or oral erosions, or both, were not found. In one instance, no characteristic clinical features were present ex-

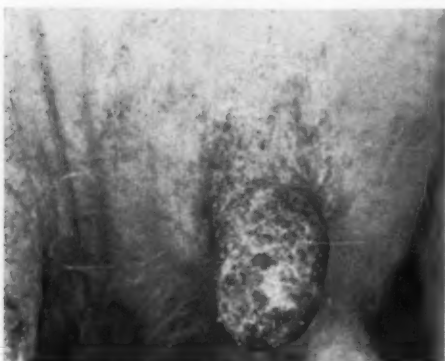


Fig. 7—Bovine testis showing hyperkeratinization with scaling and cracking, due to malignant catarrhal fever.

cept a temperature elevation of 106 F. which did not respond to antibiotics. The diagnosis was made on the basis of post-mortem lesions which will be discussed in a subsequent paper.

Clinical Pathology.—Examination of blood and urine specimens can be of value in diagnosis. Leukopenia with a shift to the left may be present in the early stages of the disease. Damage to the urinary tract may be indicated by albuminuria, glucosuria, or hematuria. The latter has been observed clinically toward the end of micturition and apparently indicates hemorrhage in the bladder.

Abortions.—The evidence seems to indicate that MCF is not a cause of abortion. No history of an unusual abortion rate on infected premises has been reported. One affected cow calved one month prematurely; however, a month after the acute episode, the calf showed no signs of the disease. The calf was weak but survived with good care, suggesting that the abortion



Fig. 8—Chronic case of MCF in a bull. Notice the poor condition due to marked weight loss and the circumscribed hairless areas (arrows).

was not due to the agent per se, but to the debilitating effects of the disease on the dam. She later died in the chronic stage of MCF. One fetus *in utero* was examined postmortem and showed no gross or microscopic evidence of infection, although the dam had died of the acute head-and-eye form of MCF. In Pennsylvania, several calves born during an enzootic were not affected by the disease.⁹

EPIZOOTIOLOGY OF THE DISEASE

Role of Sheep.—Many investigators have suspected that sheep were intermediate carriers of the virus without showing signs of the disease themselves; others do not believe this to be the case. The exact relationship, if existent, has not as yet been satisfactorily demonstrated. There is undeniable clinical evidence that the incidence of the disease in Colorado is much higher on farms and ranches where both sheep and cattle are raised.³

In Michigan, MCF occurs most frequently in the largest sheep-raising area—the southeastern part of the state, where sheep and cattle commonly share the same barn, yards, and watering troughs. Sheep are raised on 23 per cent of the farms in this area as compared with 6 per cent for the rest of the state.⁶ All of the 33 cases reported in Michigan occurred on farms where sheep were raised.

In one instance, the disease occurred in a Hereford steer on a farm where sheep raising was the main endeavor and no permanent cattle herd was maintained. This animal, purchased as 1 of 16 feeder cattle in October, 1956, developed the disease in February, 1957. A similar case had occurred on the same farm three years previously in a feeder steer. Inasmuch as no permanent cattle herd had been maintained on the farm for several years, the involvement of sheep as carriers seems indicated; however, this does not obviate the possibility of prior infection or another source of infection.

Finnish work confirmed the previously reported^{11,14} successful transmission from cattle to sheep and sheep to cattle. It was further reported that the test animals showed only slight clinical signs not typical of malignant catarrhal fever.¹¹

Susceptibility of New Additions.—The apparent susceptibility of cattle newly added to the herd has been reported in Finland.¹¹ Similar observations have been

made in this study. New animals have become infected up to one year after joining the herd, suggesting that previous exposure was not a factor. One worker believes that most cattle are either immune or have had subclinical infection.³ It seems probable that the explanation for the disease occurring in animals born and raised on the farm is a matter of individual resistance and stress factors (such as weather changes).

MORBIDITY AND MORTALITY

Bovine malignant catarrhal fever is enzootic in nature; varying intervals of time may elapse between cases. Old-timers in the enzootic area recall the occurrence of cases up to 50 years previous to the time of the present episode. Thus, historically, the disease is not a new condition in Michigan. Several investigators have stated that, once the disease occurs on the premises, it is likely to recur; these studies lend support to this statement.^{2,10} Usually, only 1 animal in a herd is affected; rarely, as many as 3 cases have occurred. A similar morbidity has been reported in Colorado.³ Seemingly, only in rare instances are several animals affected; however, it must be borne in mind that outbreaks ascribed to pasteurellosis, infectious keratoconjunctivitis, mucosal disease, or pneumonia may be MCF.

Workers have recorded a mortality of 100 per cent of affected animals in one instance, in Pennsylvania,⁹ and of at least 90 per cent in Colorado.³ A Finnish investigator, citing a total of 120 cases, observed that 27 per cent died, 38 per cent were slaughtered, and 35 per cent recovered.¹¹ The mortality in Michigan has been almost 100 per cent. A practitioner with 15 years' experience in the enzootic area reports only one recovery during this period.² A few animals, clinically diagnosed as having MCF, have appeared to be recovering only to suffer a relapse and die within a few days.

ECONOMIC ASPECTS

The exact economic importance of MCF is difficult to estimate. Few reports of this disease are made yearly in Michigan, but the cases investigated in this study indicate that the disease may be masquerading under other names such as so-called "hemorrhagic septicemia," infectious keratoconjunctivitis, atypical pneumonia,

and mucosal disease. The individual farmer unfortunate enough to have this disease on his premises suffers intermittent financial loss with varying intervening periods of no losses.

Previous investigators have reported cases involving up to 50 per cent of the herd.^{2,9,10} The cow with a chronic case may cause the owner considerable loss; the animal appears to be improving slightly, thus encouraging the farmer to continue treatment and care, only to die several months later.

SUMMARY

Bovine malignant catarrhal fever (MCF), as observed in Michigan, is an enzootic disease characterized clinically by fever (106 F.), nasal and conjunctival discharge, corneal opacity, erosions of the muzzle and oral cavity, marked depression, anorexia, rapid weight loss, erythema of the skin (particularly the udder and vulva) and, occasionally, thickening and cracking of the epithelium of the teats, tufting of the hair, and hematuria. Leukopenia may be present.

A definite seasonal incidence during late winter and early spring is indicated.

Clinical evidence points to sheep as carriers of the causative agent.

The disease is usually fatal in four to 14 days, although chronic cases may occur.

Atypical cases may be misdiagnosed as atypical pneumonia, infectious keratoconjunctivitis, pasteurellosis, or as entities of the mucosal disease complex.

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¹⁴Zanzucchi, A.: Ricerche epidemiologiche etiopatogenetiche, Cliniche ed anatomo-pathologiche sulla Febbre Catarrale Maligna. Clin. Vet., 57, (1934): 689-721.

Brucellosis in Bison, Elk, and Moose, in Canada.—In a depopulation program in the Elk Island National Park in Alberta, in the winter of 1956-1957, 343 bison, 221 elk, and 124 moose were slaughtered. On serological tests for brucellosis, all the moose were negative, while 42.27 per cent of bison and 13.12 per cent of the elk were reactors. However, 2 male moose, which were critically ill, were strongly positive for brucellosis, and *Brucella abortus* was recovered from 1.

Apparently brucellosis is a much more severe disease in moose than in other species. Two male bison, destroyed because of orchitis, were also infected. Neither was ill but there was a purulent degeneration of the testes in each. The elk are believed to play a role in the transmission of brucellosis, including transmission to cattle. —A. H. Corner and Robert Connell in *Canad. J. Comp. Med. and Vet. Sci.* (Jan., 1958): 9.

Glycerol Triacetate for Ringworm.—A new treatment for ringworm in cattle has been found at the University of Wisconsin. The agent is glycerol triacetate, which is nontoxic and nonirritating. It kills the fungus by lowering the acidity of the affected part. It has been used with success in man and on a few animals, and is expected to be on the market soon.—*Hoard's Dairyman* (Jan. 10, 1958): 12.

The Differential Leukocyte Counts in the Diagnosis and Prognosis of Bovine Traumatic Gastritis

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Bovine traumatic gastritis is probably the most important problem confronting many modern day dairy veterinary practitioners. Its importance stems from untold economic loss (in terms of milk production, weight gain, and reproductive ability) as well as fatalities.

In this as in other diseases, prevention is far more economically sound than cure, and the authors believe that the magnet (Alnico V*), given orally, is the best prophylactic agent to date. However, for relieving the frankly sick animal, rumenotomy is the preferred method.

To confirm the diagnosis of traumatic gastritis, and to provide a prognosis for surgery, the authors have found the differential leukocyte count of great value. It is our experience that the metal detector has little value in making or confirming a diagnosis of traumatic gastritis since in this area,** with dairy herds ranging from 120 to 1,000 head, practically all of the cows carry metallic objects in the reticulum. This appreciably nullifies the diagnostic efficacy of the metal detector.

This paper is prepared from the clinician's point of view and is based on our experience with about 500 rumenotomies, over a three-year period, for which there are complete differential leukocyte count reports, with operative and postoperative clinical histories. Also, approximately 200 additional differential leukocyte counts of apparently normal cows are reported as controls (table 1A).

The authors have found the total leukocyte count to be of little value in indicating the presence of infection in these cows; therefore, such counts are not included in this report. In all instances of traumatic gastritis, the total white blood cell count was within the normal range of 4,000 to 12,000 per cubic millimeter.

Drs. Carroll and Robinson specialize in bovine medicine in Buena Park, Calif.

*The Alnico V magnet is produced by Allied Sales Associates, Long Beach, Calif.

**Los Angeles-Orange counties in California.

Means and ranges of differential leukocyte values for 500 cattle with traumatic gastritis are presented (table 1) for the acute (B), subacute (C), and chronic (D) cases. Of the 500 animals, 11 per cent were salvaged for beef, due to nonreturn to adequate production; 2 per cent represented diagnostic failures; and 87 per cent made complete recoveries. We believe that the 11 per cent slaughtered represent cases with insurmountable visceral and parenchymal damage not indicated by the differential leukocyte count previous to surgical intervention. For the 2 per cent representing diagnostic failures, there is no explanation except that no diagnostic tool is entirely accurate.

Based upon the counts shown for 500 animals in parts B, C, and D of table 1, the differential leukocyte counts which could be anticipated in various stages or types of traumatic gastritis are presented (table 2) for their diagnostic and prognostic value. In confirming a clinical diagnosis of traumatic gastritis, particular attention is paid to the neutrophil-lymphocyte ratio for an indication of a shift to the left. In prog-

TABLE 1—Means and Ranges of Differential Leukocyte Values in Dairy Cattle with Traumatic Gastritis

Polymorpho-nuclear leukocytes (%)	Lympho-cytes (%)	Mono-cytes (%)	Eosino-philis (%)	Baso-philis (%)
A) For 200 normal mature dairy cattle				
33.2	61.7	1.72	3.34	0
B) Cattle with acute traumatic gastritis				
52-90*	9-44	0-3	0-15	0-0
68.8**	29.8	1.0	1.6	0
C) Cattle with subacute traumatic gastritis				
43-75	20-53	0-4	0-15	0-0
53.8	42.2	1.8	3.4	0
D) Cattle with chronic traumatic gastritis				
45-68	15-50	5-9	0-12	0-0
57.0	36.1	5.9	3.4	0

*Ranges; **means.

bovine traumatic gastritis. These interpretations are based on preoperative and postoperative findings in 500 dairy cattle on which rumenotomies were performed. There was a 2 per cent diagnostic error for which the authors feel responsible.

It is realized that the differential leukocyte values will progressively fluctuate between the initial and convalescent phases of traumatic gastritis; also from the acute to chronic phases. However, the differential leukocyte counts will remain characteristic

TABLE 2—"Idealized" Differential Leukocyte Values in Blood of Dairy Cattle Exhibiting Traumatic Gastritis

Clinical diagnosis	Body temp.	Differential Leukocyte Count					Comments
		Neut. ¹ (%)	Lymph. ² (%)	Mono. ³ (%)	Eos. ⁴ (%)	Bas. ⁵ (%)	
Normal animal	101.5	33	62	2	3	0	Normal animal
Early traumatic gastritis with peritonitis	103.0—107.0	68	29	1	2	0	Excellent surgical risk
Traumatic gastritis with localized peritonitis and adhesions	102.0—104.0	57	38	2	3	0	Good surgical risk
Traumatic gastritis with extensive adhesions	101.5—102.6	46	45	6	3	0	Seldom a good surgical risk
Traumatic pericarditis	105.0—107.0	71	15	9	5	0	Never a good surgical risk

¹Neutrophils; ²lymphocytes; ³monocytes; ⁴eosinophils; ⁵basophils.

nosing the results of surgery, attention is paid to the neutrophil-lymphocyte ratio and also the monocyte percentage. A monocyte percentage of 5 or over, in the face of a leveling neutrophil-lymphocyte ratio, is interpreted as a poor prognosis for surgical intervention.

DISCUSSION AND CONCLUSIONS

An attempt has been made to indicate the value of differential leukocyte counts as a diagnostic and prognostic tool in

whether the animal is clinically sick or in an apparent healthy condition, as long as a penetrating foreign body is present.

Bovine Leptospirosis in a Texas Herd.—Within 36 hours, 6 Hereford cows, 5 calves, and 1 bull were brought to the Texas A. & M. clinic showing severe hemoglobinuria, slight icterus, fever and, in the case of the cows, bloody milk. In the previous week, 7 calves in the herd had died.

At the clinic, all were treated with

streptomycin; the adults 2.5 Gm., the calves 0.5 Gm., twice daily. All recovered except 1 calf which, upon necropsy, showed an enlarged spleen, fatty liver, swollen kidneys, and other lesions of septicemia.

The diagnosis was confirmed by isolating leptospiras and by serological titers. The herd was vaccinated and possibly contaminated water tanks were fenced off. One cow became ill two months later.—*Southwest. Vet. (Fall, 1957): 48.*

Leptospirosis in Swine in Russia

On a state swine-raising farm in Russia, 13 apparently healthy sows which were known to have had miscarriages or still-born litters were examined serologically and bacteriologically for *Leptospira*. By the agglutination-lysis procedure, at dilutions of 1:10,000, all sows reacted positively to *Leptospira* II of the serological type "Monyakov."

Four sows, observed during infection with *Leptospira*, had positive agglutination reactions at dilutions of 1:100 and 1:10,000 in the first few days after their temperatures had returned to normal. The blood of pigs of these sows had antibodies against *Leptospira*, Monyakov type, at dilutions of 1:10,000 and higher.

When a group of young pigs clinically suspicious for leptospirosis were checked serologically, they had antibodies against *Leptospira*, Monyakov type. Thus, leptospirosis was confirmed serologically in sows, young pigs, and baby pigs.

To confirm the diagnosis bacteriologically, the paws of 2 guinea pigs were lacerated; the lacerated paws were then kept for two hours in the urine from a sow that had recovered from leptospirosis. The guinea pigs died after six to ten days, and their blood, urine, and tissues from their internal organs were inoculated on Terskikh medium. Inoculations of blood on the twelfth day and of urine on the twenty-ninth day of culture, at 28 C., resulted in growth of strains of pathogenic *Leptospira* identical with strain II, serological type Monyakov.

In November, 1954, 2 pigs, 2 months old, were inoculated with the above culture. On the fourth day postinoculation, they were ill with leptospirosis; on the tenth day, they began excreting leptospiras and continued to do so for four months, through February, 1955.

It was also established that a tank in which swine were washed was an active source for spread of the disease. Water from the tank contained *Leptospira* identical with those isolated from the animals' urine.

These observations show that swine which have recovered from leptospirosis continue to carry live organisms and to excrete them in the urine. Water in tanks infected with urine of swine, whether sick or recovered from leptospirosis, can constitute one of the agents in the spread of the infection.—*K diagnostike leptospiroza svinei Veterinariya, 34, (May, 1957): 26.*

Leptospirosis in the Hedgehog.—Thirty hedgehogs captured in New Zealand were inoculated with *Leptospira pomona* and all developed clinical leptospirosis. Those less than half grown invariably died with signs of classical Weil's disease. Adults usually survived but excreted the organism in the urine and developed high agglutination-lysis titers.—*W. M. Webster in Nature (Dec. 14, 1957): 1372.*

Location of Sulfonamides in Blood.—When 4 dogs and 4 horses, in Poland, were given sulfamethazine and sulfathiazole orally and intravenously and samples of blood were then collected, no sulfonamides could be found in the erythrocytes but much of it was adherent to the surface of these cells.—*F. Nagorski in Med. Wtryn., 13, (Sept., 1957): 546.*

Geese as Carriers of Fowl Cholera.—When cholera was diagnosed in a flock of chickens, in Germany, the entire flock was slaughtered as required by law and 3 geese that lived with the chickens were moved to another place. Six weeks later, 35 new chickens were placed with these geese. In two weeks, the chickens began to die and all appeared ill in four days. At necropsy, the geese were found to be *Pasteurella* carriers. On a second farm, one week after raw viscera from a goose was fed to chickens, 4 of 7 became ill and died of cholera.—*O. Heller in Montash. f. Vet.-med. (May 1, 1957): 218.*

A cow, 32 years old, in England, the mother of 30 calves, died as the result of eating nightshade plants.

Treatment of Porcine Leptospirosis

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THIS PAPER reports on the use of dihydrostreptomycin in the treatment of the renal carrier state (leptospirosis) in swine artificially infected with *Leptospira pomona*.

Following infection of swine, or other animals, with leptospires, there is a tendency for the organisms to become localized in the lumens of the renal tubules. From this location, they may be eliminated in the urine for several months, and it is in this manner that the leptospiral diseases are transmitted from infected animals to other animals and to man. Effective treatment of the renal carrier would aid in controlling the leptospiroses.

REVIEW OF LITERATURE

The following antibiotics have been used effectively in the treatment of leptospirosis in experimental animals, mainly hamsters: streptomycin and dihydrostreptomycin,^{2,11} tetracycline (Polyotic*),¹¹ oxytetracycline (Terramycin*),^{8,11} chlortetracycline (Aureomycin*),⁸ and erythromycin (Erythrocin*).¹¹

There are several reports concerning the treatment of porcine leptospirosis. One injection of streptomycin (approx. 2.8 mg. per lb. of body weight) was effective in eradicating leptospirosis in 2 swine.¹⁰ Also, tetracycline administered intramuscularly (3 mg. per lb., daily for five days) or chlortetracycline (200 mg. per lb. of feed, free choice for 14 days) were effective.⁶ Chlortetracycline fed at the level of 400 Gm. per ton of feed (1 Gm. per sow per day) did not satisfactorily eradicate the kidney carrier state in a group of 15 gilts.⁵ Oxytetracycline, administered to 7 swine for seven days at levels of 500 or 1,000 Gm. per ton of feed, was effective in eliminating the leptospirosis.¹

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The authors acknowledge the assistance of Drs. A. H. Hamdy and C. Gale.

*Polyotic and Aureomycin are produced by Lederle Laboratories, Pearl River, N. Y.; Terramycin by Charles Pfizer and Co., Inc., Brooklyn, N. Y.; Erythrocin by Abbott Laboratories, North Chicago, Ill.

The carrier state in swine may exist for several months, even up to a year.⁹

MATERIALS AND METHODS

Approximately 70 pigs, from 40 to 140 lb. in weight, were inoculated with *L. pomona* in order to establish a leptospirosis. Either of two strains of *L. pomona* was used, and the inoculum consisted of the organisms which had been grown in Schüffner's medium and which had just been isolated from an artificially infected pig. Regardless of the route of inoculation—intramuscular, intraperitoneal, or conjunctival sac instillation—the establishment of a leptospirosis was rather consistent.

Leptospirosis was detected by one of two methods. Most frequently used was the direct darkfield microscopic examination of a freshly collected sample of urine, using a magnification of about 150. The second method consisted of injecting from 1 to 2 ml. of the urine, intraperitoneally, into hamsters from which blood samples were taken about three weeks later to determine if antibodies had developed against *L. pomona*.

Urine was collected in beakers by arousing the pigs about noon, at which time most of them would urinate. Spraying with cold water would often stimulate urination. Male pigs would urinate more frequently than females. In most cases, urine was collected from each animal on the fourth and the fourteenth days following treatment and tested for the presence of leptospires by both darkfield microscopy and hamster inoculation. However, with most animals, additional examinations were made during a 30-day post-treatment period.

Treatment was initiated only in those animals showing numerous leptospires in their urine, which was in about 90 per cent of those inoculated. In most cases, this was between the sixteenth to thirtieth day following inoculation.

Crystalline dihydrostreptomycin sulfate or dihydrostreptomycin sulfate solution was used for treatment. The feed for the swine contained no antibiotics.

RESULTS

Both strains of *L. pomona* produced a leptospirosis which was usually first detected 15 to 20 days following inoculation. As judged by darkfield microscopic examination of the urine, untreated controls infected with either strain usually shed the leptospires rather consistently and in significant numbers for about 50 days. Because of this, an attempt was made to treat the animals as soon as leptospirosis

occurred, to allow a longer observation period. The infected animals were essentially without clinical signs. The pH of the urine was predominantly in the range from 7 to 8. Occasional samples varied in pH from 5.0 to 6.2, and in these cases leptospiras, if present, were usually non-motile.

The results of treatment with a single intramuscular injection of dihydrostreptomycin

TABLE 1—Treatment of Porcine Leptospirosis with Dihydrostreptomycin

Dosage* (mg./lb.)	Effective- ness** (%)	Animals treated (No.)	Strains†		Av. wt. (lb.)
			A	B	
3.0	33	3	3‡	0	94
5.0	80	5	5	0	96
6.9	0	1	1	0	58
8.0	50	2	0	2	91
9.0	66	3	0	3	89
10.0	100	17	7	10	69
13.0	100	8	0	8	64
15.0	100	8	0	8	146
17.0	100	4	0	4	110
20.0	100	4	0	4	150

*A single intramuscular injection; **per cent of animals that did not show leptospirosis following treatment; †two strains, A and B, of *L. pomona* used for infection; ‡number of animals injected.

mycin, at various dosages, are summarized (table 1). When animals were given 10 mg. per pound of body weight, or more, the leptospirosis ceased and was not again detected. When less than 10 mg. per pound was used, some animals still eliminated motile leptospiras in their urine. Although no detailed comparison was made, both strains of *L. pomona* appeared to be equally susceptible to both forms of dihydrostreptomycin. The effective dosages eradicated leptospiras from the urine within 48 hours.

When 1, 52-lb. pig was injected with 600,000 units of penicillin in oil, the number of motile leptospiras in the urine was markedly diminished for a few days; however, they later became as numerous as prior to treatment.

DISCUSSION

As expected, from previous work on experimental animals, various antibiotics may be used to eliminate the renal carrier state in porcine leptospirosis. One injection of dihydrostreptomycin was shown to be effective. This treatment, along with immunization, can be of considerable value in attempting to control the dissemination of this disease. It may be of most help in the treatment of breeding stock which

might be infected, especially boars that are sold for breeding purposes.

There is need for further research on simple and economical methods of controlling or eradicating leptospiral diseases. However, it would seem as though some valuable "tools" are available: a reliable serological diagnostic test; an effective immunizing agent;^{4,7} and a treatment for the eradication of the carrier state.

Penicillin was not effective in the treatment of leptospirosis in hamsters,^{2,11} and preliminary observations indicate that the same is true for swine.

However, to avoid misinterpretation of this report, a few words of caution are included. Only two strains of *L. pomona* were used and, while both appeared equally susceptible to dihydrostreptomycin, other strains may vary in this respect. There seems to be a scarcity of information on the ability of leptospiras to "build up" a resistance to antibiotics. The animals used in this study were in a rather narrow weight-range, 50 to 150 lb. The effective dose for smaller or larger swine may vary somewhat.

SUMMARY

Leptospirosis was consistently established in swine by inoculation with *Leptospira pomona*. One injection of dihydrostreptomycin (10 to 20 mg. per lb. of body wt.) was effective in eradicating leptospirosis in all of 41 animals.

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Listeriosis in Pigs

In a litter of 13 pigs, 4 became ill and 3 died after one day of illness. Necrotic foci were found in the liver, similar to those seen in artificially infected mice, and *Listeria monocytogenes* was isolated from the blood and organs.

The disease was probably transmitted from sheep—1 had died from *Listeria* encephalitis two weeks before the sow farrowed. The organisms isolated from the pigs and sheep were biochemically identical.—L. Hessen in Nord. Vet.-med 9, (Dec., 1957): 957.

A Dairyman's Approach to Mastitis

New therapies have not eliminated mastitis but they may be responsible, says the *Ayrshire Digest* (Jan., 1958), for the lethargy in the fight against that disease. This article continues as follows: The benefit of udder infusions is limited unless used with proper preventive measures. Testing the milk for organisms, then treating the quarter in the absence of inflammation seems foolish. The indiscriminate infusion of antibiotics is useless, expensive, and may be a source of irritation. Without proper aseptic means, more infection may be introduced. Even the manufacturers of such products admit that these agents loose their "punch," and that the organisms can develop resistance. Also, elimination of *Streptococcus agalactiae* seems to open the way for other organisms, even fungi.

Since the first line of defense against infection is an unbroken epithelium, proper use of milking machines is important. Fast and complete milking may be the prime preventive of mastitis. To accom-

plish this, the udder should be stimulated by massage with a warm, moist cloth, and the machine applied in not more than two minutes. The machine should be removed as soon as the milk flow ceases; however, stripping by machine will save time, avoid contamination of milk, and prevent the cow from developing poor milking habits.

The use of a strip cup detects abnormal milk, hastens the let-down process, and eliminates the milk with the highest bacterial count. It also stimulates secretion of the hormone, oxytocin, which is active for not more than seven minutes. Production of oxytocin is apparently an inherited factor; some families of cows do not produce enough to release all the milk they produce.

Intelligence of the milker is important. He should give the job his undivided attention. Cracked and sore teats should be treated with petroleum jelly. Cows with clipped udders should never be kept outside in severe weather. They need protection from drafts in barns and should not be allowed to lie on cold, damp ground, or to remain in muddy yards.

First-calf heifers should be milked promptly to avoid damage to the udder from congestion. Blind quarters in heifers are not always due to previous sucking of other calves. In one herd where calves were isolated, 4 heifers had blind quarters; all were sired by one bull.

Proteolytic Enzyme for Mastitis

Cows with mastitis were treated with various proteolytic enzymes plus antibiotics, in Britain. Of 6 cows given streptokinase-streptodornase by intramammary infusion daily for three days, 2 improved; of 6 given papain infusions daily for two days, none improved; of 63 given trypsin by various methods (all but 3 given some by intramammary infusion), 43 showed improvement; and of 7 given stabilized crystalline trypsin by intramammary infusion daily for three days, 4 showed improvement.

Most consistent results were obtained with 25 mg. of crystalline trypsin twice daily. However, the stabilized crystalline trypsin (50 mg. daily) had the advantage of requiring only one infusion daily.—W. J. Jordan in Vet. Rec. (Dec. 28, 1957): 1452.

Chlorpromazine Hydrochloride for Tetanus in the Horse

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TREATMENT OF TETANUS in the horse, once the disease is fully established, has usually not been successful. Keeping the animal in a darkened, quiet stall, plus the use of sedatives, has been the most successful rationale of treatment to date. However, the recovery rate has not been good, perhaps partly because if the sedation was carried deeply enough to relax the muscles, the animal did not eat or drink. Curare has been used in man, in paralyzing doses,² and also in the horse.^{1,3} However, the administration of curare is not without risk, and the danger of paralysis of the respiratory muscles is sufficiently great to require that facilities for artificial respiration be available.

Because of its muscle-relaxing properties, it has been proposed⁵ that chlorpromazine hydrochloride (Thorazine®) be used in the treatment of tetanus in the horse. Its use has been reported,⁴ but the swelling and pain at the site of the intramuscular (i.m.) injections may have been serious enough to contraindicate its use.

Within two months, 3 horses (2 Shetland ponies) with tetanus were presented for treatment. When first seen, the ponies were almost comatose. Chlorpromazine hydrochloride was injected intravenously (i.v.) and, though muscle relaxation occurred, both died within 48 hours. The third animal was given chlorpromazine hydrochloride i.v. as a part of the treatment, and recovered.

CASE REPORT

On Aug. 7, 1957, an American Saddlebred gelding, 7 years old and weighing approximately 1,050 lb., had gradually become "stiff" during the preceding three days, and had been unable to eat or drink for 24 hours. The horse was in fair condition, but would walk only if urged. The only evidence of injury was a small scratch on the right front fetlock. The nictitating membranes protruded constantly, and external stimulation caused practically all muscles

to contract. Its attempts to drink produced extreme trismus.

Chlorpromazine hydrochloride (150 mg.) was injected i.v. at 9:00 a.m. and, within four minutes, relaxation of all skeletal muscles and the nictitating membranes was noticed, and the animal drank several gallons of water and began to eat hay. A darkened stall was not available, so the animal was placed in a corner box stall having one small window. The effects of the injection were noticeable for approximately eight hours.

At 4:00 p.m., chlorpromazine hydrochloride was again injected (175 mg., i.v.), and again relaxation was observed within several minutes. Aqueous procaine penicillin (3,000,000 units, i.m.) was injected at this time.

On August 8, chlorpromazine hydrochloride, injected at 9:00 a.m. (175 mg., i.v.), and at 5:00 p.m. (200 mg., i.v.) again resulted in relaxation of muscles and drinking and eating within a few minutes. Tetanus antitoxin (40,000 units—all that was available) was injected, subcutaneously, and the penicillin therapy was repeated.

From August 9 to 16, at 8:00 or 9:00 a.m. and at 5:00 p.m., daily, the horse was given chlorpromazine hydrochloride (200 to 250 mg., i.v.), and the penicillin therapy (3 million units, i.m.) was repeated daily. Relaxation regularly followed the injection of chlorpromazine, except that the nictitating membrane of the right eye remained protruded one day (8-9-57). The horse ate and drank after each injection. It seemed a little worse on the fourth day (8-11-57), then gradually improved. Spasms of the nictitating membrane and stiffness of the tail were still noticeable prior to the injections on the seventh day.

On the ninth day (8-16-57), the animal could eat and drink, although slowly, before the injections. Treatment was discontinued on August 17, and the horse was sufficiently improved to leave the hospital on the fifteenth day (8-22-57).

DISCUSSION AND SUMMARY

Chlorpromazine hydrochloride (approx. 0.2 mg./lb.) was administered intravenous-

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*Thorazine is manufactured by Smith, Kline and French, Philadelphia, Pa.; it was supplied by Allied Laboratories, Inc., Indianapolis, Ind.

ly twice daily, to a horse with tetanus. Even though it was not possible to darken the stall or to prevent stimulation from external noises, each injection of the drug resulted in enough relaxation of the muscles to allow the animal to eat and drink. The effects of the drug lasted approximately eight hours, although some effect was noticeable for 15 hours. Possibly, injections of the drug at eight-hour intervals would have proved more satisfactory.

Previously, heavy sedation with chloral hydrate, or other hypnotics, had been used as a part of the treatment of tetanus. However, these drugs have the disadvantage of lowering the body temperature, plus interfering with the animal's ability to drink and eat, and if a stomach tube is used to supply nourishment, even under sedation, the stimulation produced by manipulation usually produces muscle spasms.

With the use of chlorpromazine hydrochloride, the animal is able to eat and drink and the excitement produced by passing a stomach tube is avoided.

There were no noticeable adverse effects from the continuous use of chlorpromazine hydrochloride over a period of ten days.

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- Feeding Diethylstilbestrol to Milking Cows.**—No detectable effect on milk production resulted when 11 cows were fed 10 to 15 mg. of stilbestrol daily for 60 days.—J. Dai. Sci. (Dec., 1957): 1581.
- Listeriosis Transmitted in Milk.**—Young rabbits became infected with *Erysipelothrix* (*Listeria*) *monocytogenes* when they nursed mothers which had been orally exposed a few days before or immediately after parturition. Of 16 newborn rabbits transferred from noninfected to infected does, all died within seven days, and the organism was isolated from 10. One or more offspring were infected in seven of 11 litters from does exposed immediately after parturition. Those which died when 4 days old or less usually had septicemia, while those which survived longer developed meningitis. Some may have experienced an inapparent infection.—Vet. Bull. (Dec., 1957): Item 3489.
- Bovine Actinomycosis in Yugoslavia.**—At the Belgrade abattoir, of 10,962 cattle slaughtered, actinomycosis was found in only 50 (0.45%). *Actinomyces bovis* was identified bacteriologically in 30 and *Actinobacillus lignieresii* was never found. Most of the affected animals were over 6 years old. The jaw bones were most frequently affected, although lesions occurred also in the cheeks, regional lymph nodes and, in 2 cases, in the tongue.—Vet. Glasnik, 10, (1956): 821.
- Onchocerca Worms in Cattle.**—When tissues from cattle from Wales and Ireland were examined at slaughter, the adult *Onchocerca* were found in the gastrosplenic omentum in 31 of 263 animals, and in the nuchal ligament in 44 of 249 animals. The microfilaria were found in the skin (base of the ear, sternal, inguinal, or pastern regions) in 53 of 164 animals.—Vet. Bull. (Dec., 1957): Item 3629.
- Bluetongue Vaccination of Nursing Lambs.**—Fifteen unexposed lambs from immune ewes were given 2 ml. of bluetongue vaccine when 1 to 3 months old. When challenged nine months later, all except 1 showed typical signs of bluetongue, and 1 died of the infection. Lambs should not be vaccinated until two weeks after they have been weaned.—C. W. Livingston and W. T. Hardy in Southwest Vet. (Fall, 1957): 27.
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Urine Chloride Determination in the Dog

CHARLES E. BILD

Miami, Florida

ROUTINE DETERMINATION of urine chlorides and its correlation with specific gravity are useful procedures in the dog.

Generally speaking, when a normal 3-year-old dog is on a consistent diet, 50 per cent of which is commercial feed, the urine will have a specific gravity of 1.030 to 1.040. Provided the animal is not subjected to strenuous exercise, a set and consistent amount of chloride will usually be found in the urine. In stress situations, an early and definite decrease of the urine chloride occurs in relation to specific gravity.

The urine chloride test is only a diagnostic aid, and the clinician may find many exceptions to the "rule of thumb." For instance, when one of my bird dogs is worked in the sun on a hot day, it may drink almost a gallon of water, and at the end of the working day the chloride output in the urine is extremely low. In about 48 hours, the chloride content returns to normal if the dog is not worked and is on regular feed and water intake.

In the presence of stress and nephritis, an increase of the chloride output of the urine is often an indication of improvement. Also, in periods of stress, a low chloride content in the urine, in relation to the urine specific gravity, may indicate a need for multiple electrolytes. Therefore, the test for urine chloride is sometimes a diagnostic aid and has prognostic value.

PROCEDURE

I use the Schribner revision of the Fantus test, having received the original idea from Silverman,¹ who advocated use of the test to check the salt-depletion syndrome in man. The test requires only a minute and costs only a penny. The reagents, 10 per cent potassium chromate and 0.75 per cent silver nitrate, may be procured anywhere.

Routine.—Put 10 drops of urine in a container (we use heavily waxed, smooth paper cups); add 1 drop of the potassium

chromate, using the same size dropper as for the urine; then, drop by drop, and agitating each time, add the silver nitrate solution. The end point is reached when the solution turns brown. Normal saline or lactated Ringer's solution may be used to test this routine, to determine an exact and consistent end point and to test new batches of reagents.

DISCUSSION

Often the number of drops of silver nitrate approximates the last two numerals of the specific gravity. If a urine sample from a healthy animal has a specific gravity of 1.040, the silver nitrate probably would be 35 or 40 drops. Early in periods of stress, the chloride drops more, numerically, than does the specific gravity of the urine.

Occasionally, I examine an animal whose recent history shows nothing unusual, aside from lethargy. All tests are normal except that, while the specific gravity of the urine is 1.035, 75 drops of silver nitrate are required to reach the end point. In these instances, specific questioning of the owner usually reveals the recent feeding of very salty foods.

The urine of an old dog, with a chronic compensating nephritis, may have a specific gravity of 1.010, with the silver nitrate determination at 4 or 5 drops. (I think of such kidneys as producing distilled water.) When improvement occurs in this clinically common nephritis problem, the specific gravity may change to 1.014 and the chloride determination will be found at 10 or 12 drops. If these findings are maintained, there is usually some improvement in the over-all well-being of the dog.

In a 1-year-old dog convalescing from an infectious disease, distemper for example, one may often observe a parallel between the progress in convalescence and the return to normal levels of urine specific gravity and of chloride content.

A dog may be thought of as being fully recovered from a specific ailment when the weight, hematocrit, erythrocyte sedimenta-

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¹Silverman, J. J.: A Simple Method for Detecting the Salt Depletion Syndrome During Cardiac Therapy. Postgrad. Med., 13, (June, 1953): 547.

tion rate, and urine specific gravity and chloride content have returned to normal.

The test for urine chloride furnishes worthwhile information to any clinician who routinely determines urine specific gravity. We have recorded this test more than 2,200 times since 1955.

Toxicity of Neomycin for Man.—Use of neomycin topically in skin infection, and orally in preoperative preparation of the bowel, is increasing. When injected or used topically where it can be absorbed, neomycin is known to produce renal damage and irreversible deafness. Seven cases of intoxication following the intraperitoneal use of neomycin are reported—two infants and two of the five adults died. One man, given 3 Gm. of neomycin in a 1 per cent solution intraperitoneally over 36 hours, died two weeks later from renal failure. The others suffered respiratory arrest within a few minutes after the injection, and the survivors required artificial respiration for three hours, 15 hours, and 48 hours, respectively.—*New England J. Med.* (Jan. 16, 1958): 144.

Effect of Repeated Bleeding on Donors.—It has been suggested that repeated bleeding may constitute a stressing stimulus which might impair the immune defense mechanism of the donor. However, no statistically significant modifications were observed in the bactericidal activity, opsonic index, and serum complement of donors at 24, 48, and 72 hours after bleeding.—*A. Del Campo in Riv. Ist. sieroterap. ital.* (Aug., 1957): 13.

Hygromycin B and Ascaris Suum.—Forty Duroc-Jersey pigs, 2 months old, were fed hygromycin B (12 million units/ton of feed) for 60 days at the University of Nebraska. They were practically free of *Ascaris suum* eggs, while similar groups fed chlortetracycline (Aureomycin), and the controls, had about 4,000 to 12,000 eggs per gram of feces.

Hygromycin B and chlortetracycline were compatible when fed together, the pigs gaining slightly faster than when either was fed singly. However, both in drylot and on alfalfa pasture, hygromycin B, in addition to its vermifuge action, seemed to stimulate growth almost as effectively as the other antibiotic. The pigs

on pasture consumed an average of 0.7 lb. of the compound, Hygromix, and gained an average of 13 lb. more than controls, at a cost of 35 cents each.—*Eli Lilly & Co. Release, Dec. 27, 1957.*

Tonsillar Tissue in the Larynx.—A tonsil is reported to occur in the larynx of cattle at the processus vocalis of the retinoid cartilage. It is called the "tonsilla glottica" and may be the seat of tuberculosis infection.—*Berl. u. Munch. tierärztl. Wehnschr.* (July, 1957): 288.

Fecal Impaction in a Lion Cub— A Case Report

W. CLOUGH CULLEN, D.V.M.

Mankato, Minnesota

A 125-lb. lion cub, 1 year old, was examined at the city zoo, Sept. 12, 1957. The animal was in pain and unable to rise, but would strike with its forelegs when approached. Perphenazine (Trilifon®) and prednisone (Meticorten®) were given by intramuscular injection in an attempt to quiet the cub, to allow examination. A tentative diagnosis of intestinal obstruction was given. Several hours later, the cub walked to its cage and died.



Fig. 1—Lion cub, showing fecal impaction (arrows) which caused its death.

At necropsy the next morning, a fecal impaction about 10 inches long and 8 inches in diameter (fig. 1) was found in the colon. The bladder was ruptured, which resulted in an accumulation of urine and severe peritonitis in the abdominal cavity.

Dr. Cullen is a general practitioner in Mankato, Minn. ®Trilifon and Meticorten are produced by Schering Corp., Bloomfield, N.J.

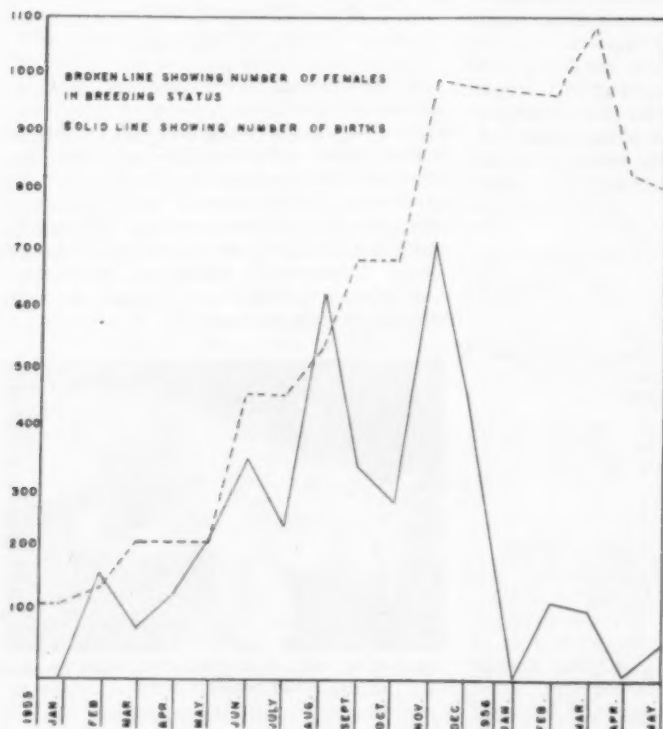
Estrogen Contamination of Pelleted Feed for Laboratory Animals—Effect on Guinea Pig Reproduction

J. F. WRIGHT, V.M.D., and H. R. SEIBOLD, V.M.D.

Greenport, Long Island, New York

A HEALTHY COLONY of experimental animals is almost indispensable to a research laboratory. When production of the colony is curtailed during an important phase of research, the losses incurred are far greater than the cost of the experimental animals. This is especially true when the nature of the project precludes the use of animals from commercial sources. This report illustrates how accidental contamina-

Recent reports^{1,2} of the effect of stilbestrol-contaminated feed on reproduction in laboratory animals indicate the need for extreme care in handling potent hormone supplements. Unintentional contamination of laboratory animal feed may occur in any feed mill which uses or stores these powerful premixes. Premixing rooms, mixers, elevators, pellet mills, and "sent-backs" or regrinds of feed containing hormone pre-



Graph 1—Normal rate of reproduction of guinea pigs during January to November, 1955, prior to the feeding of contaminated feed. There is a sharp decline in December, 1955, and January, 1956.

tion of feed caused infertility and sterility of valuable breeding stock in a previously healthy, productive colony of guinea pigs.

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mixes are all potential sources of contamination. The ever-present feed mill dust may also be a possible source of contamination, so that even feed which has been in storage where these products have been in use is not safe to use for breeding animals. At least one of the larger commer-

cial producers of animal feeds has adopted the policy of manufacturing feeds for laboratory animals in a special mill which is not used for processing estrogen-supplemented feeds.³

In July, 1955, the source of commercially-pelleted feed needed for experimental animals at this station was changed for contracting purposes. The change-over to the new pellets was complete by September, 1955. Although unknown at that time, this feed had been processed in a mill which had been used for preparing an estrogen-supplemented poultry broiler mash. The first indication that the new pellets contained abnormal amounts of estrogenic substances was a sharp decline in the number of pregnancies and births occurring in December, 1955, and January, 1956 (graph 1).

CLINICAL SIGNS AND LABORATORY FINDINGS

A vaginal discharge accompanied by swelling of the external genitalia was observed in many unweaned female guinea pigs; it was later observed in weaned females and, occasionally, in adult breeders. Several animals were found with bedding (wood shavings) adhered to the external genitalia. Unsuccessful attempts were made to isolate a microorganism from the animals showing the discharge.

NECROPSY

At necropsy, the uteri from animals with the vaginal discharge were found to be enlarged and more vascular than normal. No other gross abnormalities were observed.

HISTOPATHOLOGY

A microscopic examination of the genital tract of 7 female guinea pigs with gross enlargement of the uterus was made. Paraffin-embedded histological sections were stained with hematoxylin and eosin and by several methods for demonstrating mucin, including the periodic acid-Schiff technique, the Bauer technique (with and without previous ptyalin digestion), thionine, Mayer's mucicarmine, and alcian blue.

There was marked to extreme glandular hyperplasia of the endometrium resulting from both enlargement and multiplication of the epithelial cells lining the uterine glands (fig. 1). The cytoplasm of the greatly swollen cells appeared foamy and vacuolated in routine hematoxylin and eosin sections (fig. 2); it stained red with the periodic acid-Schiff technique, the Bauer technique (with and without previous ptyalin digestion), and Mayer's mucicarmine; it exhibited purplish metachromasia

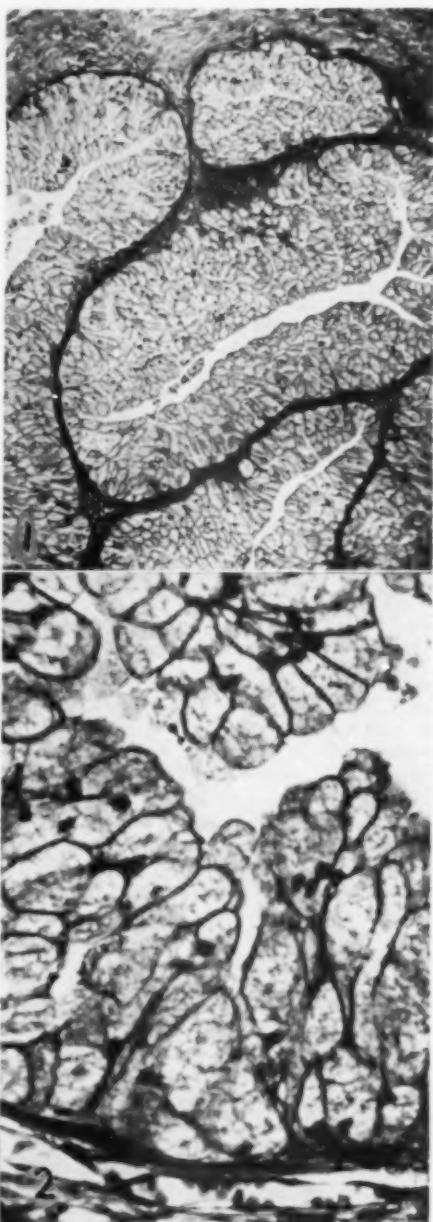


Fig. 1—Hyperplastic uterine glands of a guinea pig, showing multiplication and enlargement of epithelial cells. x 80.

Fig. 2—Portion of hyperplastic uterine gland of a guinea pig, showing cytoplasmic rarefaction and vacuolation caused by accumulation of mucin within the cells. x 410.

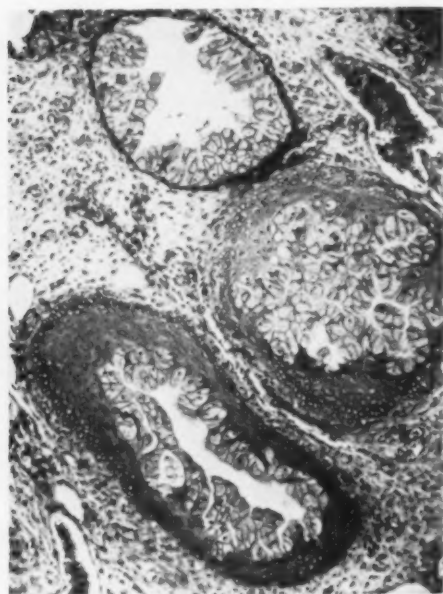


Fig. 3—Hyperplastic uterine glands of a guinea pig, undergoing squamous metaplasia. x 80.

with thionine; and it stained blue with alcian blue. These histochemical reactions demonstrated that the cytoplasmic swelling and vacuolation of the uterine glandular epithelium were caused by intracytoplasmic accumulation of mucin.

In the more severely affected uteri, areas of squamous metaplasia were seen between the basement membrane of some of the hyperplastic glands and the overlying mucin-laden cells (fig. 3). The cells undergoing squamous metaplasia did not contain mucin. The vaginal mucosa also showed well-marked squamous metaplasia, with variable superficial cornification (fig. 4).

TABLE 1—Effects of Estrogen-Contaminated Feed on Guinea Pig Production

Group	No. of breeder females in group	Total days in breeding status	No. of litters expected*	No. of litters produced
A	54	300	216	59
B	8	297	31	4
C	12	286	46	7
D	35	260	121	17
E	22	246	73	14
F	4	243	13	1
G	71	170	161	30
H	113	153	200	26
Total	319	—	861	158

*No. of litters expected = total days in breeding status times No. of breeder females in group.

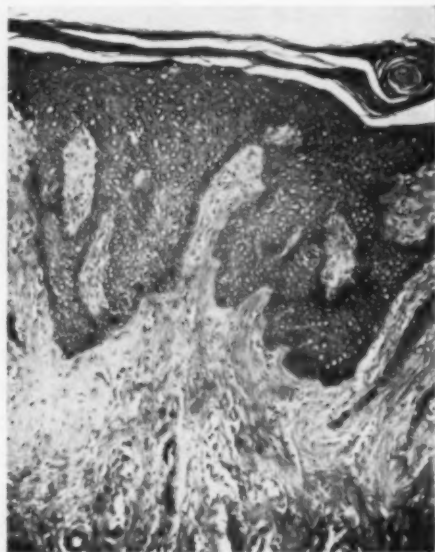


Fig. 4—Vaginal mucosa of a guinea pig, showing squamous metaplasia. x 27.5.

Ovaries from 5 of the 7 females were available for study. Many of the larger graafian follicles showed degeneration (pyknosis and karyorrhexis) of the granulosa cells. A few appeared to be developing into cystic corpora lutea without rupture of the follicle having taken place. No normal corpora lutea were seen.

DIAGNOSIS AND THERAPY

A 5-lb. sample of the suspected feed was submitted for an oral estrogen assay. This assay disclosed an estrogen contamination which was greater than 20 μ g. per kilogram of feed.*

As soon as another brand of pellets was obtained, all remaining feed thought to be contaminated with the estrogenic compound was removed from the colony buildings, and all cages, cage feeders, and bulk containers were cleaned and sterilized. As a further precaution, the interiors of the colony buildings were given a thorough washdown. Data concerning the breeding records of all remaining breeders in the affected colony are shown (table 1). In the four months following the removal of the estrogen-contaminated feed, there was no apparent improvement in the ability of these breeders to reproduce.

*Oral estrogen assay performed by the Worcester Foundation for Experimental Biology, Shrewsbury, Mass.

SUMMARY

Estrogen contamination of pelleted feed resulted in reproductive disturbances in a guinea pig colony which decreased the number of expected litters, in a given period, from 861 to 158.

Reproductive statistics presented indicate that progressive infertility followed introduction of the contaminated feed. The condition was apparently irreversible.

When the uteri from breeder guinea pigs were examined microscopically, an extreme glandular hyperplasia was observed. The more severely affected uteri showed areas of squamous metaplasia.

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²Hadlow, W. J., Grimes, E. F., and Jay, G. E., Jr.: Stilbestrol-Contaminated Feed and Reproductive Disturbances in Mice. Science, 122, (1955): 643-644.
³Proceedings, 6th Ann. Meet. Animal Care Panel, Dec. 1-2, 1955. Ralston Purina advertisement.

Vitamins for Otitis Media in Swine

In recent years, in Germany, individual pigs or entire herds have been observed with their heads twisted, with the pigs often making circular movements. The pigs are less thrifty and may run against objects but rarely become excited. These signs may disappear and the pigs may recover completely.

Infections of the nasal cavity, pharynx, or of the respiratory tract are believed to pass through the eustachian tube to cause an otitis interna or media. Occasionally, the cerebellum is affected. Since *Corynebacterium pyogenes* is considered the main causative agent, there is little hope for success with sulfonamide or antibiotic therapy.

In one experiment, where avitaminosis A was produced in 165 young pigs, the first manifestation was turning of the head to one side and evidence of otitis media. Vitamin A deficiency also reduces resistance of the mucous membrane to infection. Vitamin D deficiency may also be a factor since otitis interna is found in pigs with rachitic conditions, and mastoiditis is common in rachitic children.

While there is little benefit from therapy, losses might be prevented by feeding sufficient vitamins A and D to the sows and the young pigs. As therapy, the vitamins may

at least improve the animals' chances of reaching slaughtering weight.—H. K. Englert in *Monatsh. f. Vet.-med.* (Sept, 1, 1957): 486.

Hypervitaminosis D in a Dog and Cat.—

While doing necropsies on a dog and a cat, at Zurich, large microscopically visible calcifications were found especially in the kidneys, stomach, lungs, and blood vessels, suggesting the over feeding of vitamin D. The diagnosis was confirmed upon inquiry of the owners and veterinarians. The 11-lb. dog, 4 months old, had been given 2.4 million units of vitamin D intramuscularly during two weeks and had died of uremia. The cat, in six months, had been given 5.0 million units of vitamin D₃ and 2.5 million units of vitamin A by mouth.—P. Suter in *Schweiz. Arch. f. Tierheilk.*, 99, (Aug., 1957): 421.

Encephalitis in Pigs Due to Sodium

In Sweden, since 1940, more than 100 cases of acute or chronic noncontagious meningoencephalitis in pigs have been studied. The lesions, consisting of edema plus infiltration with eosinophilic leukocytes, were restricted to the inner layers of the cerebral cortex. All of the pigs had been fed fish waste containing salt.

A similar condition was produced by giving sodium chloride or sodium lactate (not by ammonium chloride), while restricting the pigs' water intake. The sodium ion seemed to be responsible for the lesions.—*Vet. Bull.* (Dec., 1957): Item 3665.

Iron and Copper Requirements of Calves.

—Male calves were treated for 20 weeks, at a North Carolina station, starting either when 2 days old or after a period of hemoglobin depletion. Those given no iron became anemic and gained less than the others. Those given 30 mg. or 60 mg. of iron maintained normal levels of hemoglobin and erythrocytes. They utilized 60 per cent of the iron at the 30-mg. level, and 30 per cent at the 60-mg. level. When no supplemental copper was fed, the serum-copper decreased but when given 6 mg. per day, a normal level of serum-copper was maintained. Different dietary levels of copper did not influence the hemoglobin concentration.—J. Dai. Sci. (Nov., 1957): 1437.

Feed Additives and Their Influence on Veterinary Medicine

GUEST EDITORIAL

Feed additives have been defined as "any trace ingredient not native in natural feed-stuffs in adequate amounts for optimum performance." Currently, the materials referred to as "feed additives" include vitamins, minerals, hormones, antibiotics, chemicals, enzymes, surfactants, synthetic protein, fats, and others. These substances have been found to improve the ultimate performance, under certain conditions, of livestock to which they are fed.

The objectives of veterinary medicine are: (1) conservation of man's food-producing animals; (2) protection of the public health; and (3) alleviation of animal suffering.

Thus, when feed additives are properly used, they improve the net performance of livestock and thereby enhance the primary objective of veterinary medicine—the conservation of man's food-producing animals.

However, feed additives are not always properly used and, although obvious failures probably seldom occur, there are many instances where the net effect is not conservation of livestock.

TREND ENLARGES OPPORTUNITY TO SERVE

Feed additives have influenced the practice of veterinary medicine in a number of ways. Correspondence and discussions with practitioners from all areas of the country reveal a wide range of opinions, varying from indifference to the belief that feed additives have been responsible for a desirable trend in their practice and in their client-veterinarian relationship. The consensus seems to be that the extensive advertising of claims of effectiveness has caused the producer to be more observant and more critical of animal performance and, as a result, more dependent on his veterinarian for consultation and diagnosis when performance is suboptimal.

Veterinarians have always been aware of the relationship between nutrition and animal health. However, with the development of larger livestock units, with integrated livestock production, and with larger corporate units predicted for the future, the demand for this type of professional service is expected to increase.

This trend presents an opportunity for the veterinarian to gain greater respect of

both his livestock-producing clients and feed manufacturers. Most feed manufacturers and distributors would be pleased to have the local veterinarian handle the more serious feed and feed-additive complaints. This type of professional service can be developed only if the veterinarian has a good practical knowledge of all segments of the problem—nutrition, feed additives, animal husbandry, and diagnosis.

WHOSE RESPONSIBILITY?

Experience has shown that the pitfalls of feed additives are many, particularly in the areas of prophylactic and therapeutic medications. These range from misuse of the product because of lack of indications for its use, or for other reasons, to actual manufacturing errors in the additives or feed mixture. The veterinarian should remember that a complex competitive situation, involving both the drug and feed industries, has forced the mixed feed manufacturer to assume the responsibility of blending medicinal agents in feeds, and that this has placed upon the feed manufacturer a large share of the responsibility for results in the field. Therefore, the manufacturer will use every available technological aid to insure that the feed is mixed according to the formulas.

The veterinarian's responsibility for a correct and full diagnosis, where feed additives are involved, is most apparent.

Feed additives have affected veterinary medicine because their use has made the raising of livestock more successful and, therefore, more profitable. The continuous proper use of feed additives, for best results, requires consultation with, and advice from, those with a basic knowledge of fundamentals of disease control, whether it be a nutritional or an infectious disease. The veterinarian has that basic knowledge.

Many members of the profession are keeping pace with this trend, as demonstrated by the organization of the American Association of Veterinary Nutritionists and the activities of its committees; by the organization, at state and local levels, of veterinary nutrition groups (as in Nebraska and Illinois); and by the activities of aggressive practitioners in all the states. —J. W. Cunkelman, D.V.M., Chicago, Ill.

ABSTRACTS

Rous' Sarcoma in Chickens

Three groups of 20 White Rock chickens were inoculated intramuscularly with 0.1 ml. of a cell suspension, in saline solution, of a tumor which had been growing for two weeks in ducklings inoculated with 14 (d) 7, a variant of the Rous sarcoma. Dilutions of the inocula were 1:20, 1:200, and 1:2,000, respectively. All chicks developed tumors which regressed within two months after inoculation.

Another group of 150 White Rock chickens, inoculated intramuscularly with 0.1 ml. of a 1:200 cell suspension of a fresh tumor in saline solution, had 59 deaths from generalized sarcomata within two months of inoculation. Immunological implications of these observations are discussed.—[E. F. Waller, G. H. Warren, and R. Fagan: *Growth and Regression in Chickens of a Duck Variant of the Rous Sarcoma*. *Am. J. Vet. Res.*, 19, (Jan., 1958): 204.]

Furazolidone for Pullorum Disease

Six-month-old chickens inoculated with *Salmonella pullorum* (intermediate strain) were treated with 0.011 per cent furazolidone in the mash for two- and six-week periods. *Salmonella pullorum* titers were determined at weekly intervals. Birds were cultured for *S. pullorum*. At the level used, furazolidone did not affect the titers developed except during the bacteremia and did not affect the recoverability of *S. pullorum*.—[Wilson Henderson, F. L. Walkey, and Georgia L. Morehouse: *Furazolidone Treatment of Experimental Pullorum Disease in Adult Chickens*. *Am. J. Vet. Res.*, 19, (Jan., 1958): 196-199.]

Detection of Tuberculosis in Monkeys

Chest radiographs of 39 *Macaca rhesus* monkeys in various experiments were taken at three-month intervals to attempt to detect pulmonary tuberculosis. The radiographs were taken at 100 ma., 0.1 sec. 48 k.v.p., at 36 inches with double intensifying screens. Of 9 monkeys, 8 were found to have pulmonary tuberculosis by this method, though they were negative to the tuberculin test given simultaneously in 1, one month previously in 2, and three months previously in 5.—[W. C. Dolouy, M. H. Frank, G. E. Cox, and A. L. Hesse: *Detection of Pulmonary Tuberculosis in Laboratory Monkeys by Chest Radiography*. *Am. J. Vet. Res.*, 19, (Jan., 1958): 225-229.]

Aleutian Disease in Mink

Aleutian disease occurred chiefly in Aleutian-Sapphire mink as a chronic disease of high mortality characterized by anorexia, polydipsia, and hemorrhages. The kidneys were enlarged, pale, and mottled, while the spleen was enlarged. Prominent

histological alterations were: periportal plasmacytic infiltrations and bile duct proliferations in the liver, diffuse interstitial infiltration of plasmacytes in the kidneys, and polyarteritis in smaller arteries regardless of the location.

No etiological agent was found by bacteriological and toxicological methods. Serological tests were noncontributory. Treatment by sulfonamides and antibiotics failed to alter the course of the disease.—[C. F. Helmboldt and E. L. Jungberr: *The Pathology of Aleutian Disease in Mink*. *Am. J. Vet. Res.*, 19, (Jan., 1958): 212-222.]

Agglutinins in Canine Serums

Leptospiral agglutinins were present in 16.2 per cent of 357 canine serums when tested against a battery of seven live leptospiral antigens. *Leptospira autumnalis* agglutinins were present in 41 per cent of the seropositive animals, in contrast to the 24 per cent and 12 per cent that were positive against *Leptospira canicola* and *Leptospira icterohaemorrhagiae*, respectively. Agglutinin titers against *Leptospira grippityphosa* (8%) and *Leptospira ballum* (3%) were also found.

An isolated organism, obtained from the urine of 1 dog which had a predominant *L. autumnalis* titer, was characterized as a strain of *Leptospira pomona* by cross-agglutination and agglutinin-absorption procedures, and represents the first isolation of this strain from a dog in the United States.—[L. C. Murphy, P. T. Cardeillac, A. D. Alexander, L. B. Evans, R. H. Marchwicki: *Prevalence of Agglutinins in Canine Serums to Serotypes Other than Leptospira Canicola and Leptospira Icterohaemorrhagiae—Report of Isolation of Leptospira Pomona from a Dog*. *Am. J. Vet. Res.*, 19, (Jan., 1958): 145-151.]

BOOKS AND REPORTS

Bergey's Manual of Determinative Bacteriology

The seventh edition of this manual has been divided into two volumes. Volume 1, compiled by 100 contributors, gives a classification of the bacteria and describes classes, species, and subspecies. It is invaluable as a reference source for any one working in this or related fields.

The second volume gives species inadequately placed and the less important synonyms of accepted species, along with an index to all the literature of both accepted and poorly described organisms. This would be most useful to research workers in microbiology.

Because of unsolved problems on morphology, physiology, etc., the viruses were omitted from this edition; when information on them is available, they will again be listed.—[*Bergey's Manual of Determinative Bacteriology*. By Robert S. Breed, E. G. D. Murray, Nathan R. Smith (and 94 contributors). 7th ed. 1094 pages. Williams and Wilkins Co., Baltimore 2, Md. 1957. Price \$15.00.]

THE NEWS

Annual Meeting of Livestock Conservation, Inc.

The annual meeting of the Livestock Conservation, Inc., was held at the Livestock Exchange Bldg. in Omaha, Neb., on Feb. 20, 1958. Mr. Herman C. Aaberg, president of the American Farm Bureau Federation, made the opening remarks at the opening session. A panel on "Moving Market Livestock Safely" was presented, followed by questions to the panel.

Dr. S. H. McNutt, Department of Veterinary Science, University of Wisconsin, spoke on "Teamwork in Producing Healthy Hogs." Other subjects on the morning program were: "War on the Cattle Grub, Past, Present, and Future," and "The Economics of Livestock Conservation in Animal Agriculture." The latter was presented during the luncheon by Dr. Karl D. Butler, secretary, National Institute of Animal Agriculture.

The afternoon was taken up with the annual business session, when chairmen of the various committees made their reports.

American Delegates to Geneva Conference

Two representatives of the leptospirosis laboratory (in the United States) of the World Health Organization and the Food and Agriculture Organization attended a conference on this widespread disease held Dec. 16-17, 1957, in Geneva, Switzerland. The delegates to the meeting were Lt. Col. Leslie C. Murphy, Army Veterinary Corps, and Mr. Aaron D. Alexander of the Walter Reed Army Institute of Research, Wash., D.C.

Colonel Murphy is chief of the Department of Veterinary Bacteriology at the Research Institute, and Mr. Alexander is chief of the department's research section. This department serves as one of the six reference laboratories in the world to assist WHO and FAO in the study of leptospirosis on the American continent.

Foreign representatives who contributed to the program were Drs. Borg-Peterson and Statens Seruminstitut, Copenhagen; J. C. Broom, The Wellcome Laboratories of Tropical Medicine, London; B. Babudieri, Istituto Superiore di Sanita, Rome; and J. W. Wolff, Institute for Tropical Hygiene and Geographical Pathology, Amsterdam. The conference was under the direction of Dr. Martin Kaplin, chief of the Veterinary Public Health Section, WHO.

Items on the agenda included classification of the *Leptospira* organisms, standard reference serums, diagnostic methods, and serological sur-

veys of human and animal serums. The delegates also discussed collaborative projects between their respective reference laboratories.

On Feb. 21, Colonel Murphy discussed the findings of the Geneva conference in a paper he will deliver at the eighth annual Conference on Diseases in Nature Transmissible to Man, in Houston, Texas.

Attention—Cats Going to France

The French Government tourist office advises that it has reversed itself on the six weeks' quarantine it imposed upon cats and other small animals entering France.

Effective immediately, the only requirements are: (1) certificate of health by a veterinarian; (2) United States sojourn of six months or more; and (3) freedom of rabies. New regulations are available from the Society.—*American Feline Society Release, Jan. 17, 1958.*

AMONG THE STATES AND PROVINCES

District of Columbia

District of Columbia Quarterly Meeting.—The District of Columbia Veterinary Medical Association elected new officers at a meeting held Jan. 21, 1958, at Dart Auditorium, Armed Forces Institute of Pathology. They are: Brig. Gen. Elmer Young, chief of the Army Veterinary Corps, president; Drs. Erven Ross, Washington practitioner, first vice-president; Robert Byrne, University of Maryland faculty member, second vice-president; and William I. Gay, National



Left to right (seated)—Dr. Robert Byrne, second vice-president; Brig. General Elmer Young, president; (standing) Dr. Erven Ross, first vice-president; and Dr. William I. Gay, secretary-treasurer.

Institutes of Health veterinarian, secretary-treasurer.

The guest speaker for the quarterly meeting was Dr. B. F. Hoerlein, professor of surgery at the School of Veterinary Medicine, Auburn, Ala. His subject was "The Diseases of the Canine Spinal Column."

Entering the twentieth year of its activity, the District of Columbia V.M.A. membership now includes veterinarians in federal and state government, the military services, commercial organizations, private practice, and educational institutions.

Georgia

South Georgia Association.—At the regular meeting of the South Georgia Veterinary Medical Association on Jan. 12, 1958, held in Radium Springs, the following new officers were elected: Drs. Rafe A. Houston, Blakely, president; Robert B. Phillips, Cordele, vice-president; M. W. Hale, Tifton, secretary-treasurer.

During the dinner, which followed the business meeting, the members and their wives were entertained by Dr. Charles C. Rife of Atlanta, who reported on his recent European travels.

s/MAURICE W. HALE, *Secretary-Treasurer.*

Indiana

Michiana Veterinary Medical Association.—The regular monthly meeting of the Michiana V.M.A. was held on Jan. 9, 1958, at Hotel LaSalle, South Bend. The officers elected for the ensuing year are: Drs. R. W. Worley, South Bend, Ind., president; James Carter, Elkhart, Ind., president-elect; Stanton Williamson, South Bend, Ind., vice-president; Richard Schaub, New Carlisle, Ind., secretary-treasurer; and Frank Booth, Elkhart, Ind., representative to the Indiana board of directors.

s/RICHARD SCHAUB, *Secretary.*

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Indiana V.M.A. Sponsors Public Health Conference.—On March 27, 1958, the Indiana Veterinary Medical Association and the Indiana State Board of Health will jointly sponsor a conference on "Public Health and the Veterinarian." The conference will be held in the Board of Health Auditorium in Indianapolis.

Iowa

Annual Meeting of the Iowa V.M.A.—The annual meeting of the Iowa Veterinary Medical Association was held Jan. 14-16, 1958, at the Hotel Des Moines, Des Moines. The three-day conference presented all phases of veterinary medicine.

Guest speakers on the program included Dr. W. W. Armistead, president of the AVMA, who spoke on "The Role of Organized Veterinary Medicine" and "Small Animal Practice Promotion" and Dr. C. D. Van Houweling

whose subject was "Progress in Controlling Livestock Diseases."

Large animal diseases were discussed by Drs. Paul C. Bennett, Iowa State College; Robert M. Claflin, Purdue University, Lafayette, Ind.; R. P. Link, University of Illinois, Champaign; S. J. Roberts, Cornell University, Ithaca, N. Y.; and R. O. Anderson, general practitioners, Elkhorn, Wis.

A panel on swine diseases was moderated by Dr. W. H. Calhoun, practitioner of Riceville, Iowa; those participating in the panel were Dr. D. W. Gregory, E. J. Dahlquist, J. M. Barclay, George H. Gitz, Jr., all practitioners in Iowa.

Small animal diseases and surgery were discussed by Drs. F. J. Milne, Ontario Veterinary College, Guelph; W. F. Irwin, small animal practitioner in Tulsa, Okla.; and F. J. Kingma, Food and Drug Administration, Washington, D. C.

Drs. E. S. Tierkel and James H. Steele, U. S. Public Health Service, Atlanta, Ga., spoke on rabies control and integrating the practicing veterinarian in the public health program, respectively.

President W. W. Armistead brought greeting from the AVMA at the banquet session on the evening of the first day of the conference.

Kansas

Dr. B. F. Pfister Memorial Scholarship.

The Kansas State College Endowment Association has received gifts of \$1,650 for the establishment of a Dr. B. F. Pfister memorial scholarship in veterinary medicine. It is hoped that subsequent gifts will perpetually endow the scholarship.

Dr. Pfister, a 1921 Kansas State graduate, died Oct. 6, 1957. He had, for many years, operated a small animal hospital at 4314 Main, Kansas City, Mo.

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Kansas V.M.A. Annual Meeting.—At the fifty-fourth annual meeting of the Kansas Veterinary Medical Association, held in Wichita on Jan. 12-14, 1958, a comprehensive program on all phases of veterinary practice was offered, including "Feedlot Diseases" and "Bovine Rhinotracheitis" by Dr. G. J. McLean; "A Day in Swine Practice" and "Management and Therapy of the Young Calf" by Dr. F. W. Cutlip; "Practical Hospital Procedures" (illustrated) by Dr. J. O. Knowles; "Surgery in Feline Practice" by Dr. R. J. Beamer. At a banquet held on the evening of the thirteenth, Dr. Merle L. Henrikson, of Emporia, was named "Kansas Veterinarian of the Year."

The following officers were elected: Drs. Merle L. Henrikson, Emporia, president; Loyce D. Jernigan, Council Grove, president-

elect; K. Maynard Curts, Kansas City, treasurer.

Twenty-Third Kansas Auxiliary Meeting.—

The twenty-third meeting of the Women's Auxiliary to the Kansas V.M.A. was held in Wichita on Jan. 13, 1958. At the business meeting, Mrs. Carlyle Symms, president, presided. The following officers were elected for the ensuing term: Mrs. L. W. Mohney, president; Mrs. Payne Oberst, vice-president; Mrs. S. Lester Jackson, secretary-treasurer; Mrs. Fred Ogilvie, historian.

Mrs. Lewis Moe, president of AVMA Women's Auxiliary, spoke to the group on public relations. Mrs. K. M. Curts, delegate to the AVMA Women's Auxiliary house of representatives, reported on the annual meeting in Cleveland last August. Mrs. Curts was again appointed delegate to the AVMA Women's Auxiliary convention to be held in Philadelphia August, 1958.

Mrs. Curts also reported that the auxiliary has 103 paid state members, 40 honorary members, and 120 paid AVMA Auxiliary members.

At the second session, Mr. Brian M. Forster, director of public relations of the AVMA, spoke on the women's auxiliaries and public relations. Mrs. Ann Beeman reported on the Women's Auxiliary to the student chapter of the AVMA.

s/MRS. S. LESTER JACKSON, Secretary.

Louisiana

Twenty-Seventh Louisiana Conference.—

The twenty-seventh annual conference for veterinarians was held in Pleasant Hall on the campus of the Louisiana State University, Baton Rouge, Jan. 28-29, 1958.

Large animal diseases and surgery were discussed by Drs. Hilton A. Smith, Department of Pathology, School of Veterinary Medicine, Texas A. & M. College; Earl Roth, Department of Veterinary Science, Louisiana State University; Raymond Hander, practitioner, Wichita Falls, Texas; R. J. Anderson, director, Animal Disease Eradication Branch, ARS, Washington, D. C.; Lon E. Foote, Department of Veterinary Science, Louisiana State University; H. C. Smith, Allied Laboratories, Indianapolis, Ind.; and K. W. Smith, practitioner, Sioux City, Iowa.

Small animal topics were discussed by Drs. R. D. Franks, practitioner, Shreveport; K. W. Smith, practitioner, Sioux City, Iowa.

Dr. J. G. Hardenbergh, executive secretary of the AVMA, addressed the conference at the opening session on "The American Veterinary Medical Association and You," and also spoke at the banquet Tuesday evening on "An AVMA Convention." Dr. Hilton A. Smith spoke of his trip to Brazil during the banquet session.

Maine

Dr. Clyde E. Dutton Recovers from Serious Burns.—Dr. Dutton, who was seriously burned when he attempted to rescue 46 animals from his hospital which burned on Jan. 6, 1958, is making a satisfactory recovery. He received over 400 grateful letters from clients during his illness. His hospital has been rebuilt and he expects to be back in practice at an early date.

Ninth Annual Maine Auxiliary Meeting.—

The Women's Auxiliary to the Maine Veterinary Medical Association met for its ninth annual meeting Jan. 15, 1958, at the Jefferson Hotel in Waterville. Twenty-five members and guests were present.



Left to right—Mrs. William Hersey, vice-president; Mrs. Raymond Libby, secretary; Mrs. Robert Monahan, president; and Mrs. Frank Witter, treasurer.

Officers elected for the ensuing year were: Mrs. Robert R. Monahan, Brunswick, president; Mrs. Ladd Hildenbrand, Portland, president-elect; Mrs. William Hersey, Rumford Center, vice-president; Mrs. Raymond Libby, Richmond, secretary; and Mrs. Frank Witter, Orono, treasurer.

Serving as the new board of directors are Mrs. Arlan Freeman, Herman, chairman; Mrs. Calvin Newman, Island Falls; and Mrs. John Woodcock, Pittsfield.

Mrs. Robert Monahan and Mrs. Ladd Hildenbrand were elected as delegate and alternate to the AVMA Women's Auxiliary house of representatives meeting, to be held in Philadelphia next August. Mrs. Lewis Denton of Dover-Foxcroft was appointed chairman of the Public Relations Media Committee and Mrs. Alfred Coombs as the 1958 project chairman.

Massachusetts

Massachusetts Veterinary Association.—The annual meeting of the Massachusetts Veter-

inary Association was held Jan. 29, 1958, at the Hotel Beaconsfield in Brookline.

After the business meeting and installation of officers, Dr. Forest F. Tenney, Peterborough, N.H., discussed "Present Day Problems in Cattle Practice." At the evening session, Dr. William J. Foster, Clifton, N.J., spoke on the "Conduct and Management of a Veterinary Hospital."

s/MORTON WOLF, *Secretary-Treasurer*.

Michigan

Dr. Smith Elected Chairman State Board of Agriculture.—Dr. Connor D. Smith, a Pinconning veterinarian, has been elected chairman of the State Board of Agriculture governing body of Michigan State University.



Dr. Connor D. Smith

Dr. Smith was named at the January 16 board meeting to succeed Clark L. Brody of Lansing, a member of the board since 1921 and its chairman from 1932 to 1938 and since 1948. Dr. Smith was elected to a six-year term as a member of the M.S.U. governing board effective Jan. 1, 1956. This term extends through Dec. 31, 1961.

Twice previously he was appointed to fill unexpired terms on the board, serving as a member from May, 1950, through 1953, and from December, 1954, through 1955.

Born Oct. 6, 1907, in St. Johns, Mich., Dr. Smith received his D.V.M. degree in 1930 from Michigan State and is a practicing veterinarian in Pinconning.

Mr. Brody, the outgoing chairman, has been a prominent leader in Michigan agriculture since 1915.

Minnesota

Minnesota State Annual Meeting.—The sixty-first annual meeting of the Minnesota State Veterinary Medical Association was held Jan. 20-22, 1958, in the Hotel St. Paul, St. Paul.

Dr. F. C. Driver of the Disease Control and Eradication Branch of the ARS, St. Paul, and Mr. R. L. West, executive secretary of the Minnesota Livestock Sanitary Board, St. Paul, spoke on the progress made in disease control programs. Diseases of large animals were discussed by Drs. W. P. Switzer, Iowa State College, Ames; James A. Baker, Virus Research Institute, Cornell University, Ithaca, N. Y.; B. W. Kingrey, Iowa State College, Ames; John K. Dewar, practitioner, Cherokee, Iowa; R. E. Vollmer, practitioner, Montgomery, Minn.; M. A. Emmerson, Iowa State College, Ames.

Dr. Spitzer and Dr. Lester E. Hanson, University of Minnesota, spoke on nutritional problems. Drs. E. W. Jones, Oklahoma State University, Stillwater; R. L. Rudy, Ohio State University, Columbus; R. B. Hohn, practitioner, Rochester, Minn.; D. E. Simes, practitioner, Duluth, Minn. discussed surgery in large and small animals. Diseases of small animals were discussed by Drs. James A. Baker, M. A. Emmerson, and J. E. Mosier, Kansas State College, Manhattan.

Lt. Colonel E. T. Marsh, V.C., Fort Snelling, discussed the problem of procurement of fresh milk in an overseas area; Dr. W. J. Kilpatrick, practitioner, Mediapolis, Iowa, told of the diagnosis and control of mastitis; and Mr. R. R. Rongren of the AVMA staff, Chicago, addressed the conference on the subject, "Why Stand Alone?"

Missouri

Sixty-Sixth Annual Meeting of the Missouri V.M.A.—The Missouri Veterinary Medical Association held its sixty-sixth annual meeting Feb. 9-11, 1958, at the Hotel Continental, Kansas City. At the opening session, Dr. W. L. Schondelmeyer gave the welcoming address, followed by Dr. W. L. Thomas, small animal practitioner of Little Rock, Ark., who spoke on "Handling the Small Animal Patient and Its Owner," and discussions of the role of the extension veterinarian by Dr. John B. Herrick, Ames, Iowa, and Dr. L. A. Rosner, Jefferson City, Mo.

Drs. J. D. Ray, Affiliated Laboratories, White Hall, Ill., and A. H. Quin, Jensen-Salsbery Laboratories, Kansas City, Mo., were joint speakers on swine diseases at two of the sessions.

Mr. Lewis E. Harris, director of pharmaceutical research, Norden Laboratories, Lincoln, Neb., discussed new drugs. Dr. H. E.

Kingman, Jr., assistant executive secretary of the AVMA, spoke on the "Coordination of AVMA and Local Association Public Relations Activities."

Canine diseases and nutrition were discussed by Drs. J. E. Mosier, School of Veterinary Medicine, Kansas State College; R. B. Koger, practitioner, Joplin; Joseph A. Zacher, practitioner, Kansas City; and George W. Mather, College of Veterinary Medicine, University of Minnesota.

A panel on large animal nutrition was conducted by Drs. S. H. Morrison, director of research, Pillsbury Mills, Inc., Roland A. Gesert, Food and Drug Administration, Washington, D. C., and F. E. Coley, practitioner, Boone, Mo.

At the banquet held on the evening of February 10, Dr. W. H. Mowder, Independence, was named "Missouri Veterinarian of the Year" and Dr. Stanley Smith, Columbia, was presented with the distinguished service award.

New Officers of the Kansas City V.M.A.—

At the Kansas City Veterinary Medical Association meeting, held in Kansas City, Mo., on Jan. 16, 1958, the following officers were elected: William L. Schondelmeyer, Independence, Mo., president; Albert S. Coates, Jr., Louisburg, Kan., vice-president; Frank A. O'Donnell, Parkville, Mo., secretary.

s/K. M. CURTS, *Resident Secretary*.

Greater St. Louis V.M.A.—The monthly meeting of the Greater St. Louis Veterinary Medical Association was held on Feb. 7, 1958, in the Coronado Hotel, St. Louis.

Dr. James Gillespie of the Virus Research Institute of Cornell University, Ithaca, N.Y., spoke on virus diseases.

s/CHESTER R. PLEGE, *Secretary*.

Dr. Pickett Joins African Mission.—Dr. Deets Pickett, a veterinarian with Jensen-Salsbery Laboratories, Kansas City, will be associated

on a trip to Yaounde, French Cameroons, Africa, with Mr. Phillip Carroll, St. Louis, internationally known collector of African wildlife for zoos throughout the world. Particular attention will be centered on capturing wild primates and gorillas by the new dart-gun method which injects "knockdown drugs" with a specially made carbon-dioxide-powered rifle. Dr. Pickett will also make detailed studies for Jensen-Salsbery Laboratories on the use of a new tranquilizing drug, Diquel, in capturing, handling, and shipping wild animals and birds. Full utilization of tranquilizing drugs, surgery, and hospitalization opens up a new era in humane capture and shipment of wild animals to zoos, according to Mr. Carroll who has spent 30 years in this unique business.

Dr. Pickett will edit and process thousands of feet of colored movie film to be shot by the Pickett-Carroll expedition.

Another mission of the expedition will be a cooperative project with the Communicable Disease Center, U. S. Public Health Service, Kansas City Regional Laboratories. Laboratory specimens from wild primates will be forwarded for study of systemic fungus infections. It is believed that some diseases of men, as histoplasmosis and toxoplasmosis, have a reservoir in nature among wild monkeys, apes, and gorillas.

New Jersey

Seventy-Fourth Annual Meeting of New Jersey Association.—The seventy-fourth annual meeting of the New Jersey V.M.A. was held Feb. 12-13, 1958, at the Hotel Berkeley-Carteret, Asbury Park.

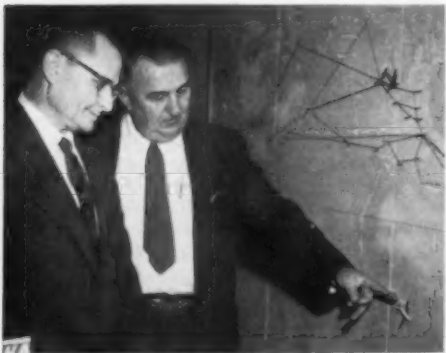
The subjects discussed were "Diseases of Cats" by Dr. R. W. Kirk, professor of Therapeutics and Small Animal Diseases, New York State Veterinary College; "Frozen Semen Ash Factor in Cattle Breeding" by Dr. J. A. Henderson, head, Department of Medicine, Ontario Veterinary College.

Dr. R. L. Rudy, chairman, Department of Veterinary Surgery, Ohio State University, discussed some aspects of canine orthopedic surgery, and Dr. B. F. Brennen, practitioner and track veterinarian, Yonkers and Roosevelt Race Tracks, spoke about lameness in horses. Clinical diseases of the eye was discussed by Dr. H. D. Simpson, American Cyanamid Company, followed by a talk on "Transition from Large to Small Animal Practice" by Dr. E. R. Cushing, practitioner of Plainfield.

At the closing session, Dr. A. F. North, Jr., practitioner of Somerville, spoke on "Inguinal Hernia in the Bitch," followed by a discussion by Dr. J. A. Henderson on infectious infertility in cattle.

Oklahoma

New Officers.—The new officers of the Oklahoma Veterinary Medical Association are



Dr. Deets Pickett (left) and Mr. Phillip Carroll point to the area in Africa where they expect to carry on their work.

Officers of the Ohio State V.M.A. for 1958



Left to right—Drs. Robert L. Knudson, secretary; C. D. Barrett, president-elect; Richard L. Rudy, vice-president; J. H. Helwig, treasurer; and J. A. McCoy, president.

Officers of the Ohio Women's Auxiliary



Left to right—Mrs. W. H. Pavey, Xenia, treasurer; Mrs. H. T. Deacon, Eaton, vice-president; Mrs. C. W. Cramley, Ashville, president; Mrs. L. H. Bremer, Middletown, immediate past-president; and Mrs. H. B. Roberts, Cleveland, secretary.

Drs. W. D. Speer, Tulsa, president; J. B. Corcoran, Stillwater, president-elect; R. E. Henry, Pawnee, vice-president; M. N. Reimenschneider, Oklahoma City, secretary; W. K. Fauks, Oklahoma City, treasurer; and C. H. Fauks, Oklahoma City, editor-manager of the *Oklahoma Veterinarian*.

Pennsylvania

Keystone Veterinary Medical Association.—

Dr. Morris C. Leikind, medical historian and archivist at the Walter Reed Army Medical Center, Washington, D. C., was the guest speaker at the Jan. 22, 1958, meeting. He spoke on "The Historian Looks at Veterinary Medicine."

A business session and refreshments completed the evening's program.

s/RAYMOND C. SNYDER, *Secretary*.



Participating in the fifty-eighth annual conference of veterinarians, held at the University of Pennsylvania on Jan. 7-8, 1958, were (left to right)—Drs. E. Wynn Jones, College of Veterinary Medicine, Oklahoma State University; Norman H. Topping, vice-president for medical affairs, University of Pennsylvania; and M. W. Allam, dean of the School of Veterinary Medicine, University of Pennsylvania.

Puerto Rico

Puerto Rico Association.—The annual meeting of the Puerto Rico V.M.A. was held on Dec. 22, 1957. The following board of directors was elected: Dr. Saes Quinones-Sambolin, president; Dr. Carlos J. Cardona, vice-president; Dr. Jose D. Rivera-Anaya, secretary-treasurer; Drs. Herbert R. Gomez and Jose A. Diaz-Bonnet, vocals.

Dr. Herbert R. Gomez, Arecibo, was elected delegate, and Dr. Carlos J. Cardona, Hato Rey, was elected alternate to the House of Representatives of the AVMA for terms starting with the 1958 convention in Philadelphia.

Matters pertaining to the betterment of the standard of our profession, to public relations, and to the establishment of a blood reserve for use of veterinarians and their families, were acted upon.

s/JOSE D. RIVERA-ANAYA, *Secretary*.

Tennessee

Tennessee Women's Auxiliary Meets.—The Women's Auxiliary to the Tennessee Veterinary Medical Association held its annual meeting Jan. 12-14 at the Andrew Jackson Hotel in Nashville.

The following officers were elected for 1958: Mrs. E. M. Spence, Jackson, president; Mrs. Earnest Feivet, Maryville, vice-president, East Tennessee; Mrs. Leonard Gray, Dixon, vice-president, Middle Tennessee; Mrs. Alex Leech, Jackson, vice-president, West Tennessee; Mrs. Eddie Randall, Nashville, secretary; Mrs. James Terry, Nashville, treasurer.

Utah

Intermountain V.M.A. Women's Auxiliary.—The Women's Auxiliary to the Intermountain V.M.A. met on Jan. 16-18, 1958, at the Hotel Utah, Salt Lake City, with Mrs. Grant Boam, Murray, Utah, presiding. Forty-six members registered. Mrs. R. E. Rebrassier, Columbus, Ohio, was the guest of honor.



The 1958 officers of the Utah Auxiliary are Mrs. O. G. Larsen (left), president; Mrs. E. H. Gibson, secretary-treasurer; and Mrs. J. E. Rasmussen, first vice-president.

Newly elected officers for 1958 are Mrs. O. G. Larsen, Logan, Utah, president; Mrs. J. E. Rasmussen, Salt Lake City, first vice-president; Mrs. Joe B. Thurmond, Orem, Utah, second vice-president; and Mrs. E. H. Gibson, Logan, Utah, secretary-treasurer.

At the business meeting, Mrs. Clyde Picht gave an interesting report on the meeting of the AVMA Women's Auxiliary held in Cleveland last August. Mrs. Wayne Binns, Logan, Utah, was appointed the first Public Relations Committee chairman of the Intermountain Auxiliary. The auxiliary voted to send \$10 to the Research Fund and \$20 to the General Fund. s/MRS. J. S. PALMER, Salt Lake City, Utah.

FOREIGN NEWS

Trinidad

Vampire Bat Rabies Expert Dies.—The JOURNAL has just recently learned of the death of Dr. J. Pawan, former pathologist of the Colonial Hospital, Port of Spain, on Nov. 3, 1957.

Doctor Pawan was the first to report in 1928 vampire bat rabies in man. He was also the first in isolating rabies virus in insectivorous and fruit-eating bats. His experimental work on blood-sucking bats (*Desmodus rotundus*) and fruit-eating bats (*Artibeus planirostris trinitatis*) confirmed investigations of the Brazilian school and proved conclusively that blood-sucking, as well as fruit-eating, bats present the classical symptoms of rabies but could survive and remain in an apparent state of health as carriers of the disease. He also demonstrated the carrier state in asymptomatic experimentally inoculated bats.

STATE BOARD EXAMINATIONS

DISTRICT OF COLUMBIA—June 26, 1958, Department of Occupations and Professions, 1740 Massachusetts Ave., N.W., Washington, D.C. A. F. McEwan, 1740 Massachusetts Ave., N.W., Washington 6, D.C., secretary.

INDIANA—July 8-9, 1958, House of Representatives, State House, Indianapolis, Ind. Joe W. Green, Room 413, 611 N. Park Ave., Indianapolis 4, Ind.

KANSAS—May 27-29, 1958, Dykstra Veterinary Hospital, Kansas State College, Manhattan, Kan. Applications must be filed by May 1, 1958. Chas. W. Bower, 1128 Kansas Ave., Topeka, Kan.

KENTUCKY—July 28, 1958, University of Kentucky, Lexington. J. K. Bushnell, 229 Houston, Paris, Ky.

MAINE—July 7-8, 1958, State House, Augusta, Maine. E. C. Moore, Turner Center, Maine.

MARYLAND—June 18, 1958, written examination; June 19, 1958, practical examination; College park, Md. Harold S. Gober, 5400 Park Heights Ave., Baltimore 15, Md.

MICHIGAN—June 9-10, 1958, Lansing, Mich. Samuel Boase, 641 Lewis Cass Bldg., Lansing 13, Mich.

MISSISSIPPI—June 17, 1958, Jackson, Miss. Wm. L. Gates, Box 417, Clarksdale, Miss.

NEW YORK—June 18, 19, 1958, practical examination, Ithaca; June 24-27, 1958, written examination, New York City, Albany, Syracuse, Buffalo, and Rochester. John W. Paige, chief, Bureau of Examinations and Registrations, 23 S. Pearl St., Albany, N.Y.

NORTH CAROLINA—June 23-25, 1958, Hotel Washington Duke, Durham, N. Car. James I. Cornwell, 65 Beverly Road, Beverly Hills, Asheville, N. Car.

NORTH DAKOTA—April 9-10, 1958, Fargo, M. C. Hawn, secretary-treasurer, 1407 13 St. No., Fargo, N. Dak.

OKLAHOMA—May 20-22, 1958, College of Veterinary Medicine, Oklahoma State University, Stillwater. Dr. Robert S. Todd, secretary-treasurer, Oklahoma Board of Veterinary Medical Examiners, 310 State Capitol, Oklahoma City, Okla.

ONTARIO—June 9-11, 1958, Ontario Veterinary College, Guelph, Ont., G. A. Edge, Box 37, Postal Station F, Toronto 5, Ont.

RHODE ISLAND—July 8-9, 1958, 505 Veterans' Memorial Bldg., Providence. R.J. T. J. Grennan, Jr., Box 31, Allenton, R. I.

SASKATCHEWAN—June 17, 1958, University of Saskatchewan, Saskatoon, Sask. Fred M. Clark, 619 9th Ave., Saskatoon, Sask.

TENNESSEE—June 23-24, 1958, Nashville, Tenn. W. O. Greene, 4119 Hillsboro Road, Nashville, Tenn.

TEXAS—May 26-28, 1958, Texas A & M College, College Station, Texas. T. D. Weaver, executive secretary, Texas State Board Veterinary Medical Examiners, 207 Capital National Bank Bldg., Austin 16, Texas.

UTAH—June 19-20, 1958, State Capitol Building, Salt Lake City, Utah. Obtain Application from Mr. Frank Lees, State Capitol Bldg., Salt Lake City. Dr. Wayne Binns, Chairman, Utah State Veterinary Board of Examiners, Utah State University, Logan, Utah.

VIRGINIA—June 26, 1958, Capitol Building, Richmond, Va. T. N. Burton, Department of Professional and Occupational Registration, P. O. Box 1-X, Richmond, Va.

WASHINGTON—May 30-June 1, 1958, Pullman, Wash. Thomas A. Carter, Administrator, Professional Division, State Department of Licenses, Olympia, Wash.

DEATHS

Star indicates member of AVMA

★**Jack C. Baker** (API '48), 46, Homewood, Ala., died Dec. 25, 1958. Dr. Baker was a life-long resident of Jefferson County where his clinic and motel for pets was well known. He was a member of the Jefferson County V.M.A., the American Animal Hospital Association, and of the AVMA. His widow survives.

Earl S. Bradley (CIN '15), West Ashville, N. Car., died Nov. 5, 1957. Dr. Bradley had served as meat inspector for West Ashville for many years.

★**Herbert I. Burke** (CVC '10), 68, New York City, died Dec. 31, 1957, of lung cancer. Dr. Burke was a thirty-second degree Mason, a Shriner, and had been a member of the New York City and New York State V.M.A.'s and of the AVMA. His widow, the former Jane Wood, survives.

★**Jack K. Bushnell** (COL '40), 41, Paris, Ky., died Jan. 5, 1958. Dr. Bushnell had practiced in Paris for 14 years. He was active in civic and professional affairs and had served as secretary of the Kentucky V.M.A. He had joined the AVMA in 1940. Dr. Bushnell's survivors include his widow, a son, and a daughter.

★**P. C. Fletcher** (OSU '22), 57, Geneva, Ill., died at St. Mary's Hospital, Rochester, Minn., on Dec. 16, 1957, following heart surgery undergone two weeks previously.

Born in Oklahoma in 1900, Dr. Fletcher received his early education in Illinois before enrolling at Ohio State University. Following graduation, he practiced in Wisconsin for a time, then became county veterinarian in DeWitt county, Illinois, and then was employed by the state as supervising veterinarian for the division of livestock industry. He was also a member of the Illinois state veterinary examining board for several years.

Surviving are his widow, the former May Donney Oakman, his mother, and three sisters.

Max C. Grandy (COL '21), 63, Fort Collins, Colo., died of a heart attack Sept. 9, 1957. Dr. Grandy was assistant veterinarian at the artificial insemination farm at Colorado State University. He is survived by his widow, two sons, and a daughter.

★**Wallace R. Gunn** (ONT '23), 66, Victoria, B.C., died in December, 1957. Dr. Gunn was livestock commissioner and director of animal industry for the livestock branch of the Department of Agriculture in British Columbia until recently when he retired to work with the Health of Animals Division. He was a member

of the Ontario and British Columbia V.M.A.'s and of the AVMA.

★**Ewald R. Klimke** (WSC '53), 28, Enumclaw, Wash., died Jan. 5, 1958, of injuries suffered in an automobile accident. Dr. Klimke was active in 4-H work, the Junior Chamber of Commerce, and the Washington State and Puget Sound V.M.A.'s, and was a member of the AVMA. His widow, a son, and his parents survive.

★**Clarence A. Krause** (KCV '03), 75, Phoenix, Ariz., died Jan. 19, 1958. Dr. Krause had served with the Bureau of Animal Industry until 1938 when he opened his own practice in Portsmouth, Va. He retired in 1947 and since 1950 had made his home in Arizona. Dr. Krause was admitted to the AVMA in 1918.

★**Harold S. MacDonald** (OVC '24), 57, prominent veterinary practitioner of Toronto, Ont., died suddenly on Jan. 17, 1958, from a heart ailment.

Born on July 1, 1900, at Glendyer, Nova Scotia, Dr. MacDonald received his preliminary education in the Pictou, N.S., high school before enrolling at Ontario Veterinary College where he received his veterinary degree in 1924. He served for a time as assistant to the late Dr. J. A. Campbell in small animal practice in Toronto.



Dr. Harold S. MacDonald

He took an active part in professional affairs locally and nationally, having served as a vice-president of the AVMA in 1939-1940, member of the committee on diseases of small animals from 1944 to 1946, and as co-chairman of the committee on reception and hospitality of the committee on local arrangements for the AVMA convention in Toronto in 1953. He was also a member of the American Animal Hospital Association; a member of the Cana-

dian Veterinary Medical Association; president of the Ontario Veterinary Association in 1943-1944; and served as a representative of his profession in the University of Toronto Senate from 1952-1956. He was also president of his service club, the Toronto Civitan Club, for two years.

Surviving are his widow, the former Janet Hazel Campbell, whom he married in 1927, a son, Dr. Donald S. MacDonald, who has been associated with his father since graduation, and a daughter, Janet.

★**John E. McCoy** (KSC '09), 72, dean emeritus of the college of veterinary medicine at Washington State College, died on Jan. 15, 1958, at the Veterans Hospital, Walla Walla, Wash.

Born in Kansas in 1886, Dr. McCoy was in



Dr. John E. McCoy

private practice there for ten years until entering the Army Veterinary Corps in 1918. Following his discharge in 1919, he again entered general practice in Twin Falls, Idaho, leaving there in 1923 to accept an instructorship on the veterinary faculty at Washington State College. In 1924, he was appointed assistant professor and, in 1944, associate professor of veterinary medicine. In April, 1952, he was appointed dean and became dean emeritus upon his retirement in September, 1952.

The veterinary clinic building was named for Dr. McCoy in 1953. He was a member of the Washington State V.M.A. and a life member of the AVMA. He was also a member of Alpha Psi, Crimson Circle Honorary, and the American Legion.

Surviving are two brothers, two sisters, a nephew, and a niece.

★**L. L. Parker** (COR '10), 71, prominent veterinarian of Catskill, N. Y., died on Dec. 21, 1957, as the result of a heart ailment.

He had practiced in Greene County for nearly 50 years and for many years took a new graduate each year for a year's training as an assistant.

Dr. Parker founded a diagnostic laboratory in 1928 and did extensive testing for brucellosis and pullorum disease. In 1951, he retired as county veterinarian but continued his practice and laboratory work. Last fall, he was made a life member of the Hudson Valley Medical society, the first veterinarian to be so honored.

Surviving are his widow, a daughter-in-law, and two grandchildren.

★**Kenneth L. Ritchie** (ISC '33), 45, West Union, Iowa, died in December, 1957. Dr. Ritchie had served with the ARS, U.S. Department of Agriculture. He was a member of the Iowa V.M.A. and of the AVMA. He is survived by his widow, two daughters, and a son.

★**John T. Schwab** (STJ '23), 67, former state veterinarian of Wisconsin, died in Tucson, Ariz., on Jan. 8, 1958, following a heart attack.

Born in Milwaukee in 1890, and educated in the high school there and at the University of Wisconsin before enrolling at St. Joseph Veterinary College, Dr. Schwab was resident veterinarian at Pabst Farms, Oconomowoc, for three years following graduation and then practiced for 20 years before accepting the post of chief of the state livestock sanitation department. He left the department in 1950.

He retired last September. He was a past-president of the Wisconsin V.M.A., and had been a member of the AVMA since 1937.

Surviving are his widow, the former Annette Backus, a daughter, and one son.

★**Ray S. Youmans** (COR '14), 65, Andover, Mass., died on Dec. 15, 1957, following a prolonged illness.

Born at Unadilla, N.Y., in 1892, Dr. Youmans had practiced in Massachusetts for many years, with the exception of time out for active service with the Army Veterinary Corps in both World Wars. During World War I, he was with the 42nd Rainbow Division in France, and in the second war, he was with the 26th Division. His army career covered a period of 27 years. After World War I, he organized the 101st Veterinary Company of the Massachusetts National Guard. He attained the rank of lieutenant colonel while in active service and retired with the rank of colonel.

Dr. Youmans took an active part in professional and civic affairs and, among appointments, served as member and secretary for a number of years of the Massachusetts board of registration in veterinary medicine. He was also a member of the Massachusetts V.M.A., the Northeastern Veterinary Association, and the Farm Bureau. He joined the AVMA in 1922.

Surviving are his widow, the former Sarah Springall, three daughters, a son, a brother, and nine grandchildren.

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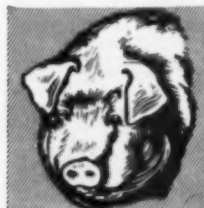
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Philadelphia—1958 Convention City

Ninety-Fifth Annual Meeting—Aug. 18-21, 1958

Local Arrangements Progressing

Housing Bureau Ready to Handle Hotel Reservations

Philadelphia will be the host city for the 95th Annual Meeting of the American Veterinary Medical Association. A city claiming many "firsts" in the history of the United States, it has also contributed much to the history of the profession.

Founded by William Penn 278 years ago, the city housed the First Continental Congress in Carpenter's Hall in 1774, the year before the Revolution. Independence Hall was the seat of government during the Revolution and houses the Liberty Bell. It was the nation's capitol until 1800, when the government moved to the District of Columbia.

The Old City is within walking distance

of the downtown hotels. Within its two square miles lies Carpenter's Hall, Independence Hall, the Home of Betsy Ross, and Elfreth's Alley, the oldest street in the United States.

America's first veterinary medical organization, the American Veterinary Association, was founded in "The City of Brotherly Love" by Dr. Robert Jennings, on May 17, 1854. Veterinary national organizations have since met six times in Philadelphia, the last time in 1927. The 1958 host city continues to contribute to the science and art of veterinary medicine through the school of Veterinary Medicine at the University of Pennsylvania.

The campus of the University of Pennsylvania, located in the western section of Philadelphia. The veterinary school is in the lower center foreground.





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Keraspray provides four potent antibacterials, plus an anesthetic, in just one puff. Keraspray, in an easy-to-use plastic insufflator, offers effective therapy for eye and ear infections, infected wounds, and following dehorning and castration.



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Neomycin sulfate	0.25%
Phenylmercuric nitrate . .	0.005%
Sulfanilamide	86.25%
Sulfisoxazole	10.0%
Tetracaine hydrochloride .	0.5%



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ORGANIZATION SECTION

LOCAL COMMITTEE ORGANIZED

The Committee on Local Arrangements, selected and sponsored by the Pennsylvania State Veterinary Medical Association, has been making preliminary plans for the convention for over a year and is now working on detailed arrangements for what is expected to be the largest AVMA gathering in recent years, if not the largest in the Association's history. Following are the general officers and chairmen of the respective committees.

Committee on Local Arrangements

OFFICERS

General Chairman — Dr. Mark W. Allam, Philadelphia
 Vice-General Chairman — Dr. Samuel F. Scheidy, Bryn Mawr
 General Secretary — Dr. Raymond C. Snyder, Upper Darby

COMMITTEE CHAIRMEN

Alumni Dinners — Dr. Alan Bachrach, Philadelphia
 Entertainment — Dr. John T. McGrath, Drexel Hill
 Exhibits — Dr. Charles O. Neuhaus, Philadelphia
 Garages, Parking & Transportation — Dr. Allen S. Vansant, Philadelphia
 Golf Tournament — Dr. W. Carroll Glenney, Wynnewood
 Hospitality and Reception — Dr. F. M. Iobst, Allentown
 Hotels and Housing — Dr. Leonard Krawitz, Philadelphia
 Meeting Rooms & Equipment — Dr. Vincent W. Ruth, Lansdale
 Publicity & Public Relations — Dr. John E. Martin, Lansdowne
 Registration & Information — Dr. Richard A. Huebner, Havertown
 Television — Dr. Charles W. Raker, Media
 Women's Activities — Mrs. Samuel F. Scheidy, Bryn Mawr; Mrs. Raymond C. Snyder, Upper Darby

HOTELS AND HOUSING BUREAU

Seven hotels have been selected to house convention registrants. Information, rates and reservation form will be found on adv. page 45 of this issue, facing a location map for hotels and other points of interest on adv. page 44.

The Philadelphia Convention and Visitors Bureau will handle reservations and is now

ready to operate. Early registrations are advised.

"Family Plan" Available. — All the hotels listed offer "family plan" rates for children 14 years of age and under. This means that no extra charge will be made for room accommodations for children of that age.

The Sheraton has been selected by the Local Committee as the headquarters hotel. All hotels have air-conditioned rooms.

CONVENTION HALL WILL HOUSE SESSIONS

Philadelphia's noted Convention Hall will provide ample and air-conditioned facilities for the general sessions, section meetings, exhibits, and some other convention activities.

SHUTTLE BUS SERVICE

Shuttle buses will be operated from the downtown area and the hotels to the Convention Hall and will provide convenient, low-cost transportation.

Candidates Nominated in Executive Board District IV Special Election

As a result of primary balloting completed on February 10, the following candidates have been nominated in the special election in Executive Board District IV to fill the unexpired portion of the term, ending in 1959, of the late Dr. R. S. Sugg. District IV comprises Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, West Virginia, Cuba, Puerto Rico, South America, and the West Indies.

The five nominees who received the highest number of votes in the primary are:

Dr. D. C. Beard, Concord, N. Car.
 Dr. M. R. Blackstock, Spartanburg, S. Car.
 Dr. Mc K. Heath, Auburn, Ala.
 Dr. C. E. Kord, Nashville, Tenn.
 Dr. C. C. Von Greppe, Decatur, Ga.

Drs. JoAnne Schmidt and E. R. Maschgan of Chicago served as tellers to count the ballots and certified the foregoing results.

Ballots were mailed to all members in District IV on February 18; the polls will close on March 20. The candidate elected will serve until the conclusion of the annual meeting in August.



- 1—Bellevue-Stratford
- 2—Benjamin Franklin
- 3—Penn-Sherwood
- 4—Robert Morris
(not pictured)
- 5—Sheraton Hotel
- 6—Sylvania Hotel
- 7—Warwick Hotel



STUDENT CHAPTER ACTIVITIES

Activities of Auburn Student Chapter.—A resume of the activities of the Auburn Student Chapter of the AVMA for the fall of 1957 follows:

On Oct. 1, 1957, Dr. R. S. Sugg, the late dean of the School of Veterinary Medicine, presented the following awards:

McAdory Award to Henry T. Baker,
Florida Auxiliary Award to James F. Grabel
and Henry F. Kerry,
Borden Award to Harry C. Current.

Henry Farleigh then presented a review of the seniors' trip to Chicago and Indianapolis, while narrating a film taken by Bob Bickham.

Following the discussion by Farleigh, Lynwood Barber, the chapter representative to the AVMA convention in Cleveland, gave an interesting report of his trip and included a summary of some of the topics discussed.

J. L. Anthony, the program chairman, on October 15, presented a film of the clinical demonstrations at the short course in July.

The annual AVMA Student Chapter picnic was held on October 26 at Lake Chewacla, with plenty of barbecued pork and chicken. Games and entertainment were provided by the social committee following the feeding.

Dr. Joe Sledge, large animal practitioner from Greensboro, Ala., was the guest speaker for the November 5 meeting.

Dr. H. C. Smith, of Allied Laboratories, on November 19, spoke on swine diseases. Dr. Smith presented a series of slides along with an interesting discussion of some of the more important swine diseases which he had seen in recent years.

On Dec. 3, Mr. G. B. Phillips, animal industry specialist, presented an informative discussion while showing a number of slides he had taken during his visit behind the Iron Curtain. Mr. Phillips' tour included Poland, Russia, and several other countries under Communist influence.

Attendance for all of the fall meetings was excellent.

S/SAMUEL W. KEYES, Secretary.

• • •

A Report from the Illinois Student Chapter.—As retiring secretary of the University of Illinois Student Chapter of the American Veterinary Medical Association, I present in summary the activities of the past semesters.

September 20, 1957—Dr. Brazner, a small animal practitioner of Danville, Ill., gave a talk on "Facts the Prospective Veterinarian Should Face."

President of the chapter, Paul Trovillion, ex-

plained to the student body that the petition to the University Board of Trustees had been granted, i.e., that the College of Veterinary Medicine, along with the College of Law, be considered a professional school.

October 3, 1957—A general practitioner from Piper City, Ill., Dr. Raudabaugh, gave an interesting talk on "Long Ropes and Strong Stakes."

Al Koltviet, student delegate, reported briefly on his attendance at the AVMA annual meeting in Cleveland, last August.

As a result of obtaining a professional school rating, two new committees were formed: the Student Discipline Committee, whose members are the president-elect and treasurer, and the Student Affairs Committee, whose members are the class representatives of the sophomore, junior, and senior classes.

The College of Veterinary Medicine has obtained a professional section in the University publication, the *Illio*.

October 18, 1957—The alumni dance was held under the supervision of the student chapter.

November 7, 1957—Dr. Griffiths, small animal clinician at the College of Veterinary Medicine, showed slides on his recent trip to Wales and England.

November 21, 1957—Dr. Marsh, a general practitioner from Princeton, Ill., presented interesting facts that the prospective veterinarian should anticipate in starting a practice. Following his talk, Dr. Marsh showed slides on large animal surgery.

A note of interest concerning the veterinary college student publication: The chapter voted to be sole owners, with financial support from the Illinois State Association and the Alumni Association.

December 5, 1957—"A Comparison of the Economics of a Small and Large Animal Practice" was a most beneficial talk given by Dr. McKinly, a large animal practitioner of Erie, Pa. Dr. McKinly showed a movie on the use of a special type of cattle sling.

December 19, 1957—"For Professional Fees" was the topic presented by Mr. Harold Steele, a prominent farmer from Princeton, Ill. In his talk, Mr. Steele gave the future veterinarian a good idea of what the farmer expects in return for fees. Mrs. Steele preceded her husband's talk with bits of information the prospective veterinarian's wife might want to know.

January 2, 1958—Dr. Maksic, a small animal clinician from the College of Veterinary Medicine, compared European and American school systems, both from the standpoint of courses required and methods of teaching.

The new officers elected for the coming term are Robert Williams, president-elect; Richard Schiltz, vice-president; Robert Mack, secretary.

S/DALE M. BENNET, Retiring Secretary

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herd management • Proven clinical effectiveness against the majority
of causative organisms . . . staphylococci, streptococci, *Escherichia* and
Pseudomonas . . .^{1,2} • Little or no development of bacterial resistance²—
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Furacin has been shown to be strikingly effective in controlling mastitis under field conditions.^{3,4} Of 7,123 lactating cows with acute mastitis, fair to excellent results were obtained in 5,597 (78%). Of 3,418 dry cows which had had mastitis during their previous lactating period, fair to excellent results were obtained in 3,104 (90%).⁴ Furacin is highly effective also in combination with other antibacterials. In 7,104 quarters treated with Furacin-penicillin, “. . . marked improvement for the remainder of the lactation period, or complete clinical cures, occurred in 6,536 (92%).”⁵ In another study with Furacin-penicillin, it is reported, “The total incidence of clinical mastitis in both herds has decreased to almost the vanishing point . . .”¹ These results have been confirmed,⁶ and a subsequent increase in milk production and lack of any clinical signs of irritation have been noted.

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References: 1. Kakavas, J. C.; Roberts, H. D. B.; de Courcy, S. J. and Ewing, D. L.: *J. Am. Vet. M. Ass.* 119:203 (Sept.) 1961. 2. Kakavas, J. C.: *Antibiotics Annual 1954-1955*, New York, Medical Encyclopedia, Inc., 1955, p. 323. 3. Mires, M. H. and Chadwick, R. H.: *Vet. News* 16:3 (Jan.-Feb.) 1947. 4. Mires, M. H.: *J. Am. Vet. M. Ass.* 117:49 (July) 1950. 5. Mires, M. H.: *Vet. News* 14:9 (May-June) 1951. 6. Roberts, H. D. B.; Kakavas, J. C. and Biddle, E. S.: *N. Amer. Vet.* 34:247 (April) 1953.

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President—Mrs. Leslie H. Moe, 1814 W. Third Ave., Stillwater, Okla.

Secretary—Mrs. A. W. Eivers, 1595 N. 18th, Salem, Ore.

Complimentary Membership in the AVMA Auxiliary.—The custom of presenting complimentary memberships in the Women's Auxiliary to the American Veterinary Medical Association began in the spring of 1956. At that time, Mrs. Lewis Moe presented over 500 membership cards to the wives of graduating veterinary students, whose student auxiliaries were affiliated with the national auxiliary. Last year, almost 600 of these memberships were extended by Mrs. E. A. Woelffer. This year we expect to have the privilege of extending 1,600 complimentary membership cards.

Complimentary membership is a welcome to these new members to our national auxiliary and an invitation to become permanent members of our organization at the beginning of the next calendar year. The membership cards are presented at special graduation functions held in honor of the "senior" student auxiliary members at the respective veterinary schools. Sometimes the cards are presented by the deans of the veterinary schools, or a member of the national auxiliary.

This spring we are happy to again present the complimentary memberships and to welcome these new members to their national auxiliary. We wish to congratulate each member on her "graduation"; to wish her success and happiness in the coming years; and to cordially invite her to continue her membership in the Woman's Auxiliary to the AVMA.

S/(Mrs. E. E.) FREDA LEASURE,
First Vice-President.

An Indiana sow which lived 22 years and farrowed 41 litters is reported to have farrowed a total of 336 pigs, 5 in her last litter.—*Prairie Farmer*, Feb. 15, 1958.

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COMING MEETINGS

Alabama Veterinary Medical Association. Annual meeting. Hotel Stafford, Tuscaloosa, March 16-18, 1958. McKenzie Heath, School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn, secretary.

Washington, State College of. Annual Conference of Veterinarians. Pullman, Wash. April 7-9, 1958. W. R. Leader, program chairman.

Western Poultry Disease Workers Conference. Pullman, Wash., April 8, 1958. R. D. Conrad, secretary.

North Central Iowa Veterinary Medical Association. Annual meeting. Warden Hotel, Fort Dodge, Iowa, April 17, 1958. H. Engelbrecht, secretary-treasurer.

National Institute of Animal Agriculture. Eighth annual meeting. Memorial Union Bldg., Purdue University, Lafayette, Ind., April 20-22, 1958. Harry J. Reed, chairman.

American Animal Hospital Association. Silver anniversary meeting. Drake Hotel, Chicago, Ill., April 23-26, 1958. Dr. Wayne H. Riser, secretary.

Oklahoma State University. Oklahoma conference for Veterinarians. College of Veterinary Medicine, Oklahoma State University, Stillwater, May 5-6, 1958. Lester Johnson, Department of Veterinary Medicine and Surgery, chairman.

Eastern Iowa Veterinary Association. Twenty-fourth annual all-day Practitioners' clinic. Hawkeye Downs, Cedar Rapids, Iowa, May 6, 1958. F. E. Brutsman, Tracer, Iowa, secretary.

Michigan Veterinary Medical Association. Annual meeting. Grand Hotel, Mackinaw Island, June 2-4, 1958. Charles Coy, Hillsdale, general chairman.

Texas A. & M. College. Eleventh annual Texas conference for veterinarians. School of Veterinary Medicine, Texas A. & M. College, College Station, June 5-6, 1958. R. D. Turk, chairman.

Kansas State College. Annual conference for veterinarians. School of Veterinary Medicine, Kansas State College, Manhattan, June 5-7, 1958. E. E. Leasure, dean.

Montana Veterinary Medical Association. Summer meeting. Missoula, June 16-18, 1958. G. A. Morrison, 316 Central Ave., Great Falls, Mont., secretary.

Georgia-South Carolina Veterinary Medical Association. Joint Meeting. Bon Air Hotel, Augusta, Ga., June 19-21, 1958. A.M. Mills, 325 Pinecrest Drive, Athens, Ga., secretary, program committee.

Idaho and Wyoming Veterinary Medical Association. Joint meeting. Jackson Hole, Wyo., June 21-23, 1958. A. P. Schneider, 3025 N. 23rd St., Boise, Idaho, IVMA secretary; J. F. Ryff, P.O. Box 960, Laramie, Wyo., WVMA secretary.

North Carolina State Veterinary Medical Association. Fifty-

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Make your diagnosis from the picture below—then turn the page ▶

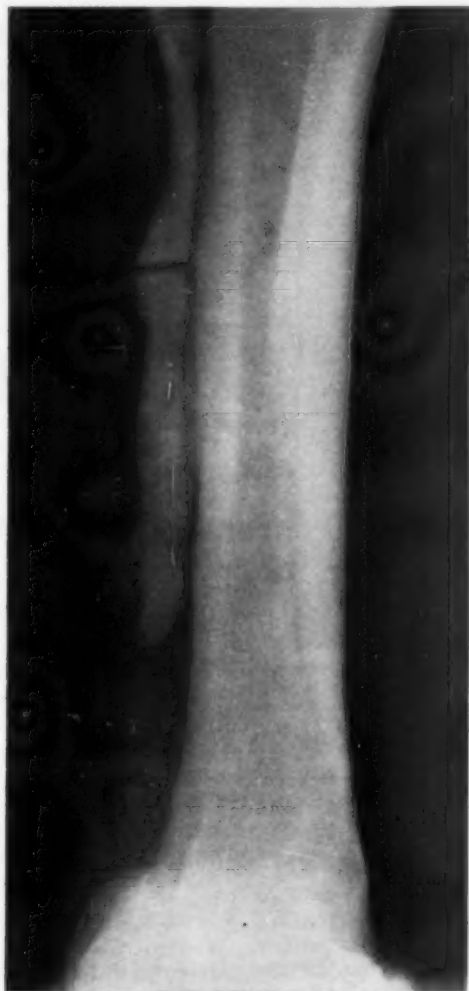


Figure 1

History.—A Standardbred gelding, 7 years old, purchased as a "lame horse," was examined and lateral view radiographs of the metacarpal region were taken of both forelegs.

Here Is the Diagnosis

(Continued from preceding page)

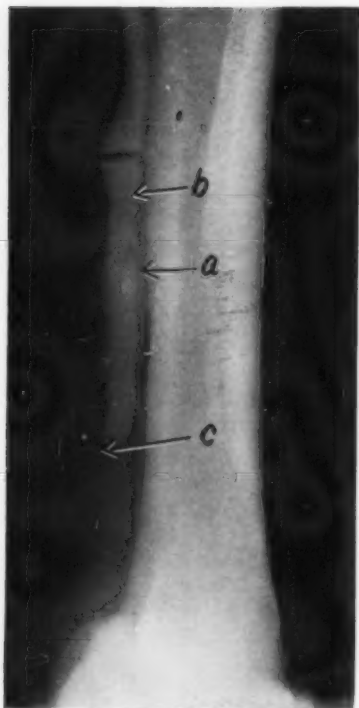


Fig. 2—Lateral view of fractured fourth metacarpal showing fusion (a) with the third metacarpal, rarefaction (b), and a sequestrum (c) as the result of necrosis.

Diagnosis.—Transverse fracture of the fourth metacarpal bone.

First comment.—This is one of the most marked "splint" fractures seen at this clinic. When repaired by surgery, considerable dissection was required to free the bone from the firmly adherent suspensory ligament because of the extensive bone changes. The horse recovered sufficiently to again become a "winner."

Second comment.—Nutrition to the distal portion of the fourth metacarpal has apparently been at least partially interrupted. The opposite surface of the third metacarpal (fig. 2) shows periostitis, with evidence of fusion with the distal fragment which shows areas of rarefaction, irregular borders, and a sequestrum at the distal extremity, thus indicating necrosis.

This case report was submitted by Dr. F. J. Milne, M.R.C.V.S., professor of Surgery and Obstetrics, Ontario Veterinary College, Guelph.

Our readers are invited to submit histories, radiographs, and diagnoses of interesting cases which are suitable for publication.

A Council for Foreign Medical Graduates

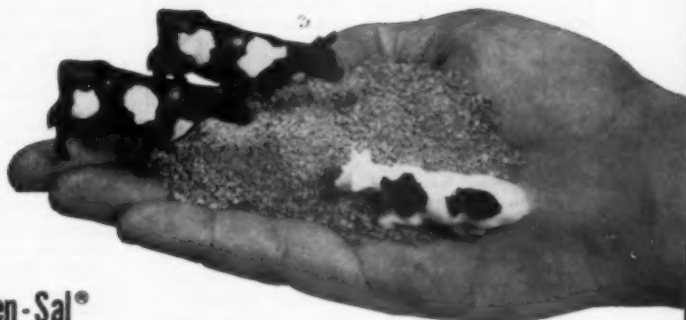
After three years of planning, the Educational Council for Foreign Medical Graduates became operative in October, 1957, with an office in Evanston, Ill. The executive director is Dr. Dean F. Smiley, former secretary of the Association of the American Medical Colleges. The Council will distribute to foreign medical graduates authentic information regarding the opportunities, difficulties, and pitfalls involved in coming to the United States, either as an exchange student to take

training as an intern or resident in a U. S. hospital, or coming on an immigrant visa with the hope of becoming licensed to practice.

The Council will not serve as a placement agency. It will not attempt to evaluate or approve any foreign medical school, its program being based on evaluation of the professional competence of the individual. It will not act as an intercessor for foreign medical graduates having problems with state boards of medical licensure or specialty boards. The new agency is sponsored by four leading medical organizations.—*J. Am. M. A. (Nov. 30, 1957): 1706.*

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*Vet. Med., 52, (1957): 601-605

†U.S. Pat. No. 2,772,167

¹J. of Nutrition, 53:1, May, 1954

²Armour Research Foundation Report Project No. C616

³J. of Dairy Science, XL: 9, (1957): 1087-1092

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seventh annual meeting. The Washington Duke Hotel, Durham, June 24-26, 1958. C. J. Lange, 3741 Hi-Point Rd., Greenboro, secretary-treasurer.

Utah Veterinary Medical Association. Annual meeting. Ogden, June 25-26, 1958. J. A. Thomas, P.O. Box 592, Provo, secretary.

Alabama Polytechnic Institute. Annual conference for veterinarians. School of Veterinary Medicine, Auburn, July 20-23, 1958. T. C. Fitzgerald, program chairman.

Canadian Veterinary Medical Association. Tenth annual Convention. Royal Alexandra Hotel, Winnipeg, Manitoba, July 21-23, 1958. Claude Kealey, 1195 Wellington St., Ottawa 3, Ont., executive secretary.

New York State Veterinary Medical Society. Sixty-seventh annual meeting. Concord Hotel, Kiamasha Lake, N. Y., Sept. 10-12, 1958. Joan S. Halat, 803 Varick St., Utica, N. Y., executive secretary.

New England Veterinary Medical Association. Annual meeting. Hotel Wentworth, Portsmouth, N. H., Sept. 21-24, 1958. C. Lawrence Blakely, 100 Longwood Ave., Boston 15, Mass., secretary-treasurer.

Eastern Iowa Veterinary Association. Forty-fifth annual meeting. Hotel Roosevelt, Cedar Rapids, Iowa, Oct. 16-17, 1958. F. E. Brutsman, Traer, Iowa, secretary.

Oklahoma Veterinary Medical Association. Annual meeting. Mayo Hotel, Tulsa, Jan. 25-27, 1959. M. N. Riemschneider, 122 State Capitol Bldg., Oklahoma City, secretary.

Foreign Meetings

Sixth International Congresses on Tropical Medicine and Malaria. Lisbon, Portugal, Sept. 5-13, 1958. Professor Manuel R. Pinto, Institute of Tropical Medicine, Lisbon,

secretary-general. (Membership application forms may be obtained by U.S. veterinarians by writing to the AVMA.)

Regularly Scheduled Meetings

ALABAMA—Central Alabama Veterinary Association, the first Thursday of each month. Dr. G. W. Jones, Main St., Prattville, Ala., secretary-treasurer.

Jefferson County Veterinary Medical Association, the second Thursday of each month. S. A. Price, 213 N. 15th St., Birmingham, secretary.

Mobile-Baldwin Veterinary Medical Association, the third Tuesday of each month. W. David Gross, 771 Holcombe Ave., Mobile, Ala., secretary.

North Alabama Veterinary Medical Association, the second Thursday of November, January, March, May, July, and September, in Decatur, Ala. Ray A. Ashwander, Decatur, Ala., secretary.

North East Alabama Veterinary Medical Association, the second Tuesday of every other month. Leonard J. Hill, P.O. Box 761, Gadsden, Ala., secretary-treasurer.

ARIZONA—Central Arizona Veterinary Medical Association, the second Tuesday of each month. Keith T. Maddy, Phoenix, Ariz., secretary.

Southern Arizona Veterinary Medical Association, the third Wednesday of each month at 7:30 p.m. E. T. Anderson, Rt. 2 Box 697, Tucson, Ariz., secretary.

CALIFORNIA—Alameda-Contra Costa Veterinary Medical Association, the fourth Wednesday of Jan., March, May, June, Aug., Oct., and Nov. Leo Goldston, 3793 Broadway, Oakland 11, Calif., secretary.

Bay Counties Veterinary Medical Association, the second Tuesday of February, April, July, September, and December. Herb Warren, 3004 16 St., San Francisco, Calif., executive secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. R. B. Barnaleau, 2333 E. Mineral King, Visalia, Calif., secretary.

Kern County Veterinary Medical Association, the first Thursday evening of each month. A. L. Irwin, 301 Taft Highway, Bakersfield, Calif., secretary.

Mid-Coast Veterinary Medical Association, the first Thursday of every even month. W. H. Rockey, P. O. Box 121, San Luis Obispo, Calif., secretary.

Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. Lewis J. Campbell, 90 Corral de Tierra, Salinas, Calif., secretary.

North San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month at the Hotel Covell, in Modesto, Calif. Lyle A. Baker, Turlock, Calif., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month. Chester A. Maeda, 766 E. Highland Ave., San Bernardino, Calif., secretary.

Orange County Veterinary Medical Association, the third Thursday of each month. Donald E. Lind, 2643 N. Main St., Santa Ana, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. R. M. Granfield, 2600 W. El Camino Real, San Mateo, Calif., secretary-treasurer.

Redwood Empire Veterinary Medical Association, the third Thursday of each month. Robert E. Clark, Napa, Calif., secretary.

Sacramento Valley Veterinary Medical Association, the second Wednesday of each month. W. E. Steinmetz, 4227 Freepoint Blvd., Sacramento, Calif., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month. H. R. Rossoll, 1795 Moore St., San Diego, Calif., secretary.

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San Fernando Valley Veterinary Medical Association, the second Friday of each month at the Casa Escobar Restaurant in Studio City. Dr. Rolf Reese, 23815 Ventura Blvd., Calabasas, Calif., secretary.

Santa Clara Valley Veterinary Association, the fourth Tuesday of each month. Kay Beulley, N. Fourth and Gish Rd., San Jose, Calif., secretary.

Southern California Veterinary Medical Association, the last Wednesday of each month. Don Mahan, 1919 Wilshire Blvd., Los Angeles 57, Calif., executive secretary.

Tulare County Veterinary Medical Association, the second Thursday of each month. D. E. Britten, 544 N. Ben Maddox, Visalia, Calif., secretary.

COLORADO—Denver Area Veterinary Society, the fourth Tuesday of every month. Richard C. Tolley, 5060 S. Broadway St., Englewood, Colo., secretary.

Northern Colorado Veterinary Medical Society, the first Monday of each month. M. A. Hammarlund, School of Veterinary Medicine, Colorado A. & M. College, Fort Collins, Colo., secretary.

DELAWARE—New Castle County Veterinary Association, the first Tuesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. E. J. Hathaway, Clifton Park Manor, Apt. 73-5, Wilmington 2, Del., secretary.

FLORIDA—Central Florida Veterinary Medical Association, the first Tuesday of each month, time and place specified monthly. Jack H. McElyer, 5925 Edgewater Drive, Orlando, Fla., secretary.

Florida West Coast Veterinary Medical Association, the second Wednesday of each month at the Lighthouse Inn, in St. Petersburg. R. L. Bruns, 336 E. 15th St., Hialeah, Fla., secretary.

Jacksonville Veterinary Medical Association, the first Thursday of every month. Dodsons Restaurant, P. S. Roy, 4443 Atlantic Blvd., Jacksonville, Fla., secretary.

Northwest Florida Veterinary Medical Society, third Wednesday of each month, time and place specified monthly. T. R. Geci, 108B Catherine Ave., Pensacola, Fla., secretary.

Palm Beach Veterinary Society, the last Thursday of each month in the county office building at 810 Datura St., West Palm Beach. J. J. McCarthy, 500-25th Street, West Palm Beach, Fla., secretary.

Ridge Veterinary Medical Association, the fourth Thursday of each month in Bartow, Fla. Paul J. Myers, Winter Haven, Fla., secretary.

South Florida Veterinary Society, the third Wednesday of each month. Time and place specified monthly. Frank Mueller, Jr., 4148 E. 8th Ave., Hialeah, Fla., secretary.

Suwannee Valley Veterinary Association, the fourth Tuesday of each month, Hotel Thomas, Gainesville. W. B. Martin, Jr., 3002 N. W. 6th St., Gainesville, Fla., secretary.

Volusia County Veterinary Medical Association, the fourth Thursday of each month. A. E. Hixon, 131 Mary St., Daytona Beach, Fla., secretary.

GEORGIA—Atlanta Veterinary Society, the second Tuesday of every month at the Elks Home on Peachtree St., Atlanta, Ga. J. L. Christopher, Smyrna, Ga., secretary.

ILLINOIS—Chicago Veterinary Medical Association, the second Tuesday of each month. Mark E. Davenport, Jr., 215 S. Edgewood Ave., LaGrange, Ill., secretary.

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*Link, R. P.; Newton, D. I., and Huber, W. G.: The Use of Prednisolone in Bovine Ketosis, paper presented at the 93rd Annual Meeting, A.V.M.A., San Antonio, Texas, Oct. 15-18, 1956.



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INDIANA—Central Indiana Veterinary Medical Association, the second Wednesday of each month. Peter Johnson, Jr., 4410 N. Keystone Ave., Indianapolis 5, secretary.

Michiana Veterinary Medical Association, the second Thursday of every month except July and December, at the Hotel LaSalle, South Bend, Ind. J. M. Carter, 3421 S. Main St., Elkhart, Ind., secretary.

Tenth District Veterinary Medical Association, the third Thursday of each month. J. S. Baker, P. O. Box 52, Pendleton, Ind., secretary.

IOWA—Cedar Valley Veterinary Medical Association, the second Monday of each month, except January, July, August, and October in Black's Tea Room, Waterloo, Iowa. A. J. Cotten, Grundy Center, secretary.

Central Iowa Veterinary Medical Association, the third Monday of each month, except June, July, and August, at 6:30 p.m., Breeze House, Ankeny, Iowa. John Herrick, Ames, secretary.

Coon Valley Veterinary Medical Association, the second Wednesday of each month, September through May, at 7:30 p.m., Cobblestone Inn, Storm Lake, Iowa. Robert McCutcheon, Holstein, secretary.

East Central Iowa Association, the second Thursday of each month at 6:30 p.m., usually in Cedar Rapids, Iowa. Dr. J. G. Irwin, Iowa City, secretary.

Fayette County Veterinary Medical Association, the third Thursday of each month at 6:30 p.m. in West Union, Iowa. H. J. Morgan, West Union, secretary.

Lakes Veterinary Association, the first Tuesday of each month, September through May, at 6:30 p.m., at the Gardison Hotel, Estherville, Iowa. Barry Barnes, Milford, secretary.

North Central Iowa Veterinary Medical Association, the third Thursday of April, at the Warden Hotel, Fort Dodge, Iowa. H. Engelbrecht, P. O. Box 797, Fort Dodge, secretary.

Northeast Iowa-Southern Minnesota Veterinary Association, the first Tuesday of February, May, August, and November at the Wisneslick Hotel, Decorah, Iowa, 6:30 p.m. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Northwest Iowa Veterinary Medical Association, the second Tuesday of February, May, September, and December, at the Community Bldg., Sheldon. W. Ver Meer, Hull, secretary.

Southeastern Iowa Veterinary Association, the first Tuesday of each month at Mt. Pleasant, Iowa. Warren Kilpatrick, Mediapolis, secretary.

Southwestern Iowa Veterinary Medical Association, the first Tuesday of April and October, Hotel Chieftain, Council Bluffs, Iowa. J. P. Stream, Creston, secretary.

Upper Iowa Veterinary Medical Association, the third Tuesday of each month at 7:00 p.m., at All Vets Center, Clear Lake, Iowa. Richard Baum, Osage, secretary.

KENTUCKY—Central Kentucky Veterinary Medical Association, the first Wednesday of each month. L. S. Shirrell, Versailles Rd., Frankfort, secretary.

Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday evening of each month in Louisville or within a radius of 50 miles. W. E. Bewley, P.O. Box "H," Crestwood, secretary.

MARYLAND—Baltimore City Veterinary Medical Association, the second Thursday of each month, September through May (except December), at 9:00 p.m., at the Park Plaza Hotel, Charles and Madison St., Baltimore, Md. Norman Herbert, 3506 Joann Drive, Baltimore 7, Md., secretary.

MICHIGAN—Mid-State Veterinary Medical Association,



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the fourth Thursday of each month with the exception of November and December. Robert E. Kader, 5034 Armstrong Rd., Lansing 17, Mich., secretary.

Saginaw Valley Veterinary Medical Association, the last Wednesday of each month. S. Correll, Rt. 1, Midland, Mich., secretary.

Southeastern Veterinary Medical Association, the fourth Wednesday of every month, September through May. Gilbert Meyer, 14003 E. Seven Mile Rd., Detroit 5, Mich., secretary.

MISSOURI—Greater St. Louis Veterinary Medical Association, the first Friday of each month (except July and August), at the Coronado Hotel, Lindell Blvd. and Spring Ave., St. Louis, Mo., at 8 p.m. Chester R. Plegge, 4249 Peck St., St. Louis 7, Mo., secretary.

Kansas City Veterinary Medical Association and Kansas City Small Animal Hospital Association, the third Thursday of each month at the Hotel President, Kansas City, Mo. Frank A. O'Donnell, Parkville, Mo., secretary-treasurer.

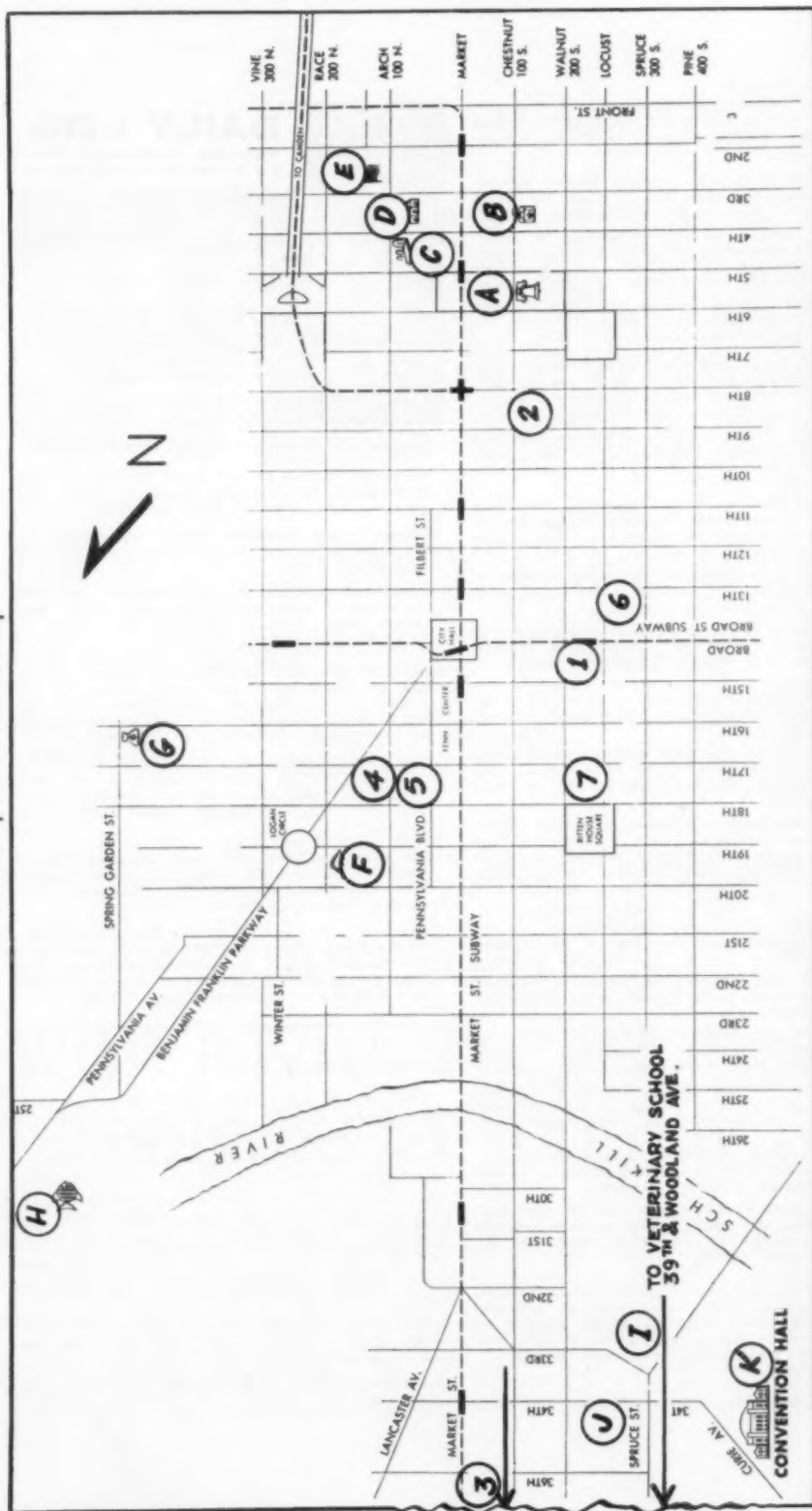
NEW JERSEY—Central New Jersey Veterinary Medical Association, the second Thursday of November, January, March, and May at Old Hights Inn, Hightstown, N. J. David C. Tudor, Cranbury, N. J., secretary.

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday evening of each month from October through April at the Academy of Medicine, 91 Lincoln Park South, Newark, N. J. Myron S. Arlein, 2172 Milburn Ave., Maplewood, N. J., secretary.

Breeder's Gazette Sold

Sam Guard, a cousin of Dr. Willard F. Guard, has sold the *Breeder's Gazette*, one of America's oldest and most respected agricultural journals. Established in 1881, the *Gazette*, at the turn of the century, was without a peer in the field of agricultural journals. As the name indicates, it was devoted chiefly to information on livestock breeding, especially the draft horse. As a result, its supremacy receded somewhat as that noble animal gradually disappeared from the American scene. The *Gazette* has been purchased by American Agricultural Services, Inc., and will be moved from Spencer, Ind., to Columbia, Mo. The new publisher is R. Lano Barron but Sam will remain as editor-in-chief.—*Breeder's Gazette* (Jan., 1958): 5.

Philadelphia Location Map



G. U.S. Mint (Guided Tours)
H. Aquarium
I. University Museum
J. University of Pennsylvania
K. Convention Hall

C. Franklin's Grave
D. Friends' Meeting House
E. Betsy Ross House
F. Academy of Natural Sciences

6. Sylvania Hotel
7. Warwick Hotel
A. Independence Hall
B. Carpenters' Hall

1. Bellevue-Stratford Hotel
2. Benjamin Franklin Hotel
3. Penn-Sherwood
4. Robert Morris (not pictured)
5. Sheraton Hotel

HOTEL RESERVATIONS — PHILADELPHIA CONVENTION

Ninety-Fifth Annual AVMA Meeting, Aug. 18-21, 1958

All requests for hotel accommodations will be handled by a Housing Bureau in cooperation with the Committee on Local Arrangements. The Bureau will clear all requests and confirm reservations.

Hotels and Rate Schedule				
Hotel	Single	Double	Twin	Suite
1. Bellevue-Stratford †	\$ 9.00-11.00	\$12.00-16.00	\$12.00-17.00	\$30.00-50.00*
2. Benjamin-Franklin †	9.00-11.00	12.00-15.00	16.00-18.00
3. Penn Sherwood †	6.00- 7.50	11.00	13.50-14.00	15.50*
4. Robert Morris †	6.00	9.50	11.00
5. Sheraton †	9.85-13.50	13.00	15.00-17.00	30.50-41.00*
6. Sylvania ††	7.50- 9.50	10.00-13.00	25.00-27.50*
7. Warwick †	12.00-14.00	15.00-18.00	30.00-35.00*
† Air-Conditioned				
†† Partly Air-Conditioned				
* 2-room suite				
FAMILY PLAN — The 7 hotels listed above offer a "Family Plan" whereby children under 14 years of age receive accommodations free of charge. For more detailed information, contact the Housing Bureau.				

Tear Off

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To: Housing Bureau, Philadelphia Convention and Visitors Bureau, Inc., Penn Square Building, Juniper & Filbert Sts., Philadelphia, Pa.

Hotel	Accommodations
(Three choices MUST be shown)	_____ Single Room(s) @ \$ _____
First choice hotel _____	_____ Double Room(s) @ \$ _____
Second choice hotel _____	_____ Twin-bed Room(s) @ \$ _____
Third choice hotel _____	_____ 2-Room Suite @ \$ _____

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() p.m.

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REFERENCES: 1. Bull, W. S.; N. Amer. Vet., in press. 2. Henry, R. T., and Blackburn, E. G.; Vet. Med., in press.

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*Jones, S. V.; Belloff, G. B., and Roberts, H. D. B.; Vet. Med. 51:413 (Sept.) 1956.

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Northwest Jersey Veterinary Society, the third Wednesday of every odd month. G. R. Muller, 43 Church St., Lambertville, N. J., secretary.

Southern New Jersey Veterinary Medical Association, the fourth Tuesday of each month at the Collingswood Veterinary Hospital, Collingswood. R. M. Sauer, secretary.

NEW YORK—New York City, Inc., Veterinary Medical Association of, the first Wednesday of each month at the New York Academy of Sciences, 2 East 63rd St., New York City. C. E. DeCamp, 43 West 61st St., New York 23, N. Y., secretary.

New York State Veterinary College, Annual conference for veterinarians. Cornell University, Ithaca. W. A. Hagan, New York State Veterinary College, Cornell University, Ithaca, N. Y., dean.

Monroe County Veterinary Medical Association, the first Thursday of even-numbered months except August. Irwin Bircher, 30 University Ave., Rochester, N. Y., secretary.

NORTH CAROLINA—Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel, Greensboro. Joseph A. Lombardo, 411 Woodlawn Ave., Greensboro, secretary.

Eastern North Carolina Veterinary Medical Association, the first Friday of each month, time and place specified monthly. Byron H. Brow, Box 453, Goldsboro, N. Car., secretary.

Piedmont Veterinary Medical Association, the last Friday of each month. Ted L. James, Box 245, Newton, N. Car. Twin Carolinas Veterinary Medical Association, the third Thursday of each month in the Orange Bowl

Restaurant, Rockingham, N. Car., at 7:30 p.m. James R. Burgess, Rockingham, N. Car., secretary.

Western North Carolina Veterinary Medical Association, the second Thursday of every month at 7:00 p.m. in the George Vanderbilt Hotel, Asheville, N. Car. Vilu Lind, 346 State St., Marion, N. Car., secretary.

OHIO—Cincinnati Veterinary Medical Association, the third Tuesday of every month at Shuller's Wigwam, 6210 Hamilton Ave., at North Bend Road. G. C. Lewis, Cincinnati, Ohio, secretary-treasurer.

Columbus Academy of Veterinary Medicine, every month, September through May. E. M. Simonson, Columbus, Ohio, secretary-treasurer.

Cuyahoga County Veterinary Medical Association, the first Wednesday in September, October, December, February, March, April, and May, at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. F. A. Coy, Cleveland, Ohio, secretary.

Dayton Veterinary Medical Association, the third Tuesday of every month. O. W. Fallang, Dayton, secretary.

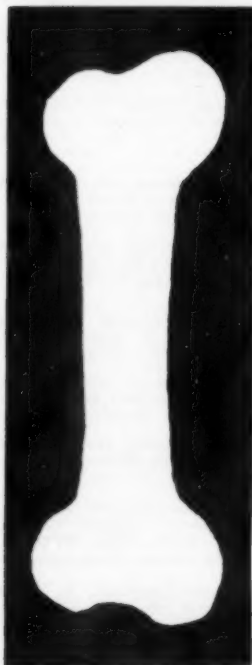
Killbuck Valley Veterinary Medical Association, the first Wednesday of alternate months beginning with February. D. J. Kern, Killbuck, Ohio, secretary-treasurer.

Mahoning County Veterinary Medical Association, the third Tuesday of each month, at 9:00 p.m., Youngstown Maennerchor Club, Youngstown, Ohio. Sam Segall, 2935 Glenwood Ave., Youngstown, secretary.

Miami Valley Veterinary Medical Association, the first Wednesday of December, March, June, and September. J. M. Westfall, Greenville, Ohio, secretary-treasurer.

North Central Ohio Veterinary Medical Association, the last Wednesday of each month except during the summer. R. W. McClung, Tiffin, Ohio, secretary-treasurer.

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Stark County Veterinary Medical Association, the second Tuesday of every month, at McBrides Emerald Lounge, Canton, Ohio. M. L. Willen, 4423 Tuscarawas St., Canton, Ohio, secretary.

Summit County Veterinary Medical Association, the last Tuesday of every month (except June, July, and August), at the Mayflower Hotel, Akron, Ohio. M. L. Scott, Akron, Ohio, secretary-treasurer.

Tri-County Veterinary Medical Association, the fourth Wednesday of January, May, and September. Mrs. R. Slusher, Mason, Ohio, secretary-treasurer.

OKLAHOMA—Oklahoma County Veterinary Medical Association, the second Wednesday of every month, 7:30 p.m., Patrick's Foods Cafe, 1016 N.W. 23rd St., Oklahoma City. Forest H. Stockton, 2716 S.W. 29th St., Oklahoma City, Okla., secretary.

Tulsa Veterinary Medical Association, the third Thursday of each month in Directors' Parlor of the Brookside State Bank, Tulsa, Okla. Don L. Hohmann, 538 S. Madison St., Tulsa, Okla., secretary.

OREGON—Portland Veterinary Medical Association, the second Tuesday of each month, at 7:30 p.m., Ireland's Restaurant, Lloyds', 718 N.E. 12th Ave., Portland. Donald L. Moyer, 8415 S.E. McLoughlin Blvd., Portland 2, Ore., secretary.

Willamette Veterinarian Medical Association, the third Tuesday of each month, except July and August, at the Marion Hotel, Salem. Marvin M. Corff, McMinnville, Ore., secretary.

PENNSYLVANIA—Keystone Veterinary Medical Association, the fourth Wednesday of each month at the University of Pennsylvania, School of Veterinary Medicine. Raymond C. Snyder, N. E. Corner 47th St. and Hazel Ave., Philadelphia 43, Pa., secretary.

Lehigh Valley Veterinary Medical Association, the first Tuesday of each month. Stewart Rockwell, 10th and Chestnut Sts., Emmaus, Pa., secretary.

Pennsylvania Northern Tier Veterinary Medical Association, the third Wednesday of each odd numbered month. R. L. Michel, Troy, Pa., secretary.

SOUTH CAROLINA—Piedmont Veterinary Medical Association, the third Wednesday of each month at the Fairforest Hotel, Union, S. Car. Worth Lanier, York, S. Car., secretary.

TEXAS—Coastal Bend Veterinary Association, the second Wednesday of each month. J. Marvin Prewitt, 4141 Lexington Blvd., Corpus Christi, Texas, secretary.

VIRGINIA—Central Virginia Veterinarians' Association, the third Thursday of each month at the William Byrd Hotel in Richmond at 8:00 p.m. M. R. Levy, 312 W. Cary Ct., Richmond 20, Va., secretary.

Northern Virginia Veterinary Conference, the second Tuesday of each month. Francis E. Mullen, 1130 S. Main St., Harrisonburg, Va., secretary-treasurer.

Northern Virginia Veterinary Society, the Second Wednesday of every third month. Meeting place announced by letter. H. C. Newman, Box 145, Merrifield, secretary.

Southwest Virginia Veterinary Medical Association, the first Thursday of each month. I. D. Wilson, Blackburg, secretary.

WASHINGTON—Seattle Veterinary Medical Association, the third Monday of each month, Magnolia American Legion Hall, 2870 32nd W., Seattle, Wash. William S. Green, 9637 S. E. 36th, Mercer Island, Wash., secretary.

South Puget Sound Veterinary Association, the second Thursday of each month except July and August. O. I. Bailey, P. O. Box 906, Olympia, Wash., secretary.

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WISCONSIN—Central Wisconsin Veterinary Medical Association, the second Tuesday of each quarter (March, June, Sept., Dec.). R. J. O'Hern, P.O. Box 617, Cumberland, Wis., secretary.

Dane County Veterinary Medical Association, the second Thursday of each month. Dr. E. P. Pope, 409 Farley Ave., Madison, Wis., secretary.

Milwaukee Veterinary Medical Association, the third Tuesday of each month, at the Half-Way House, Blue Mound Rd. Dr. R. H. Steinkraus, 7701 N. 59th St., Milwaukee, Wis., secretary.

Northeastern Wisconsin Veterinary Medical Association, the third Wednesday in April. William Madison, 218 E. Washington St., Appleton, Wis., secretary.

Rock Valley Veterinary Medical Association, the first Wednesday of each month. W. E. Lyle, P. O. Box 107, Deerfield, Wis., secretary.

Southeastern Veterinary Medical Association, the third Thursday of each month. John R. Curtis, 419 Cook St., Portage, Wis., secretary.

Wisconsin Valley Veterinary Medical Association, the second Tuesday of every other month. E. S. Scobell, Rt. 2, Wausau, Wis., secretary.

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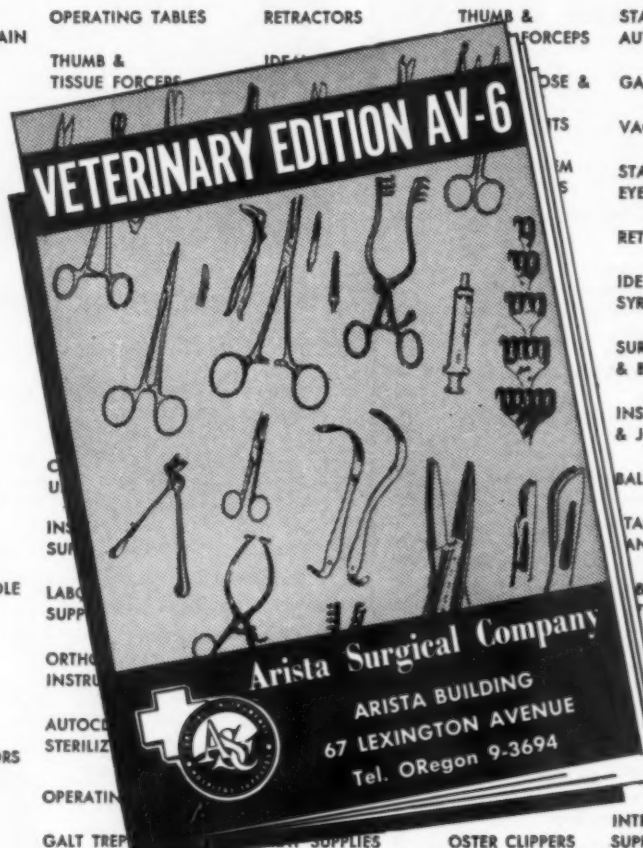
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*maximum tissue concentration
 for dependable immunity*

High tissue content of Jen-Sal Rabies Vaccine provides high vaccine virus titres for maximum immune response. In critical tests, dogs vaccinated with a standard 3 cc. dose of Jen-Sal vaccine consistently withstood virulent street virus challenge.

*homogenized tissue
 reconstitution*

Jen-Sal Rabies Vaccine reconstitutes in seconds. Tissue particles, minute enough to permit passage through a 24 gauge needle,

assure a vaccine which is both effective and easy to administer. No evidence of undue pain or local irritation is noted on routine administration.

*newest production refinements
 give you a superior product*

Jen-Sal Rabies Vaccine contains living, safety-proved Flury virus modified by egg passage. Virus loss in storage is inhibited by new lyophilization refinements plus a Jen-Sal stabilizing agent. Meticulous control and rigorous testing guarantee a uniform vaccine of incomparable quality. Supplied in 10 dose bulk vial and 5—1 dose package.

JENSEN-SALSBERY LABORATORIES, INC.

KANSAS CITY, MISSOURI

